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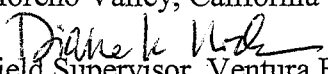
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January 9, 2006

Memorandum

To: District Manager, California Desert District, Bureau of Land Management,
Moreno Valley, California

From: 
Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California

Subject: Biological Opinion for the California Desert Conservation Area Plan
[West Mojave Plan] (6840(P) CA-063.50) (1-8-03-F-58)

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the California Desert Conservation Area Plan, as proposed to be amended by the West Mojave Plan. At issue are the effects of the California Desert Conservation Area Plan, as proposed to be amended by the West Mojave Plan, on the federally threatened desert tortoise (*Gopherus agassizii*) and Parish's daisy (*Erigeron parishii*) and the endangered Cushenbury milk-vetch (*Astragalus albens*) and Lane Mountain milk-vetch (*A. jaegerianus*); you also requested formal consultation regarding critical habitat of the first three species. This document was prepared in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). Your request for formal consultation was dated July 15, 2003.

This biological opinion is based on information in: the final environmental impact report and statement for the West Mojave Plan (Bureau of Land Management (Bureau) et al. 2005); various written and oral communications, including meetings among staff of the Service and the Bureau; and various reports and publications. A complete administrative record of this consultation is on file at the Service's Ventura Fish and Wildlife Office.

CONSULTATION HISTORY

History of the West Mojave Plan

Preparation of the West Mojave Plan began in January 1992 with several scoping meetings. The Bureau sought and obtained the participation of local and State agencies, resource agencies, and stakeholders in attempting to craft a plan that balanced conservation, recreation, and economic needs. The participants in the planning process met, either in full groups or committees, numerous times over approximately 10 years. A final round of scoping meetings, to assist in

preparing the draft environmental impact statement, was held in June and July 2002. In January and February 2003, local agencies held scoping meetings to begin preparation of environmental documents, pursuant to the California Environmental Quality Act (Bureau et al. 2005). The draft environmental impact report and statement was released to the public in May 2003; the final environmental impact report and statement was released in March 2005. These documents contain a more detailed description of the planning process that generated the West Mojave Plan.

The final environmental impact report and statement for the West Mojave Plan (Bureau et al. 2005) actually describes two separate but related processes. The environmental impact report and statement describes the Bureau's proposed amendment to the California Desert Conservation Area Plan, which is the subject of this consultation. It also describes a habitat conservation plan in support of an incidental take permit, pursuant to section 10(a)(1)(B) of the Act, that non-federal entities in the western Mojave Desert planning area are in the process of preparing. If the Service issues an incidental take permit to the non-federal entities, the habitat conservation plan would complement the management actions that the Bureau has proposed to undertake on public lands. At the appropriate time, the effects of the proposed issuance of an incidental take permit for the non-federal portion of the West Mojave Plan will be evaluated in a separate biological opinion.

History of the California Desert Conservation Area Plan Consultations

On March 16, 2000, the Center for Biological Diversity, the Sierra Club, and the Public Employees for Environmental Responsibility filed a lawsuit against the Bureau. The plaintiffs alleged that the Bureau violated section 7(a)(2) of the Act and its implementing regulations by failing to initiate and complete a programmatic consultation with the Service on the effects of the California Desert Conservation Area Plan, its amendments, and all related actions that may affect listed species in the California Desert Conservation Area that are authorized, approved, allowed, or otherwise carried out pursuant to the California Desert Conservation Area Plan and its amendments. The plaintiffs also alleged that the Bureau violated section 7(d) of the Act and its implementing regulations by authorizing, allowing, or otherwise carrying out a variety of land use practices and other projects that may affect federally listed species prior to completing consultation with the Service on the California Desert Conservation Area Plan and its amendments.

On August 25, 2000, the plaintiffs and the Bureau signed a settlement agreement that was approved by the U.S. District Court, Northern California Division as a Consent Decree. Terms of the agreement required that the Bureau enter into formal consultation with the Service under section 7(a)(2) of the Act on the California Desert Conservation Area Plan as it would be modified by proposed amendments resulting from various planning efforts, such as the Northern and Eastern Mojave Desert Management Plan and Northern and Eastern Colorado Desert Coordinated Management Plan. On January 16, 2001, the plaintiffs and the Bureau agreed to a second settlement agreement that described 58 interim measures intended to promote the conservation of various listed species within the California desert.

The Consent Decree was amended on May 1, 2002. This amendment incorporated 15 additional interim measures intended to promote the conservation of various listed species within the California desert. Two measures were specific to the planning area in the western Mojave Desert.

Because the California Desert Conservation Area covers approximately 25 million acres and land management issues are substantially different across the desert landscape, the Bureau divided the California Desert Conservation Area into five bioregional planning areas. These planning areas include the western Mojave Desert, the northern and eastern Mojave Desert, the northern and eastern Colorado Desert, the western Colorado Desert, and the Coachella Valley. Planning efforts have been completed in all regions, except for the western Mojave Desert bioregion.

The Bureau and Service agreed that the most efficient means of consulting on the California Desert Conservation Area Plan was to address specific groups of species in separate consultations. Therefore, the requirement of the first settlement agreement was satisfied in a series of consultations, with the Service issuing biological opinions for numerous species throughout the California desert; this biological opinion will complete the consultation process on the California Desert Conservation Area Plan. The following paragraphs describe those consultations that are relevant to the western Mojave Desert planning area.

In a biological opinion dated June 17, 2002, we concluded that the California Desert Conservation Area Plan, as it had been formally amended since 1980, modified by previous consultations related to grazing in the western Mojave Desert, modified by proposed interim conservation measures, and proposed to be modified by the Northern and Eastern Mojave Desert Management Plan and Northern and Eastern Colorado Desert Coordinated Management Plan, was not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat (Service 2002a).

On December 17, 2002, we issued a biological opinion in which we concluded that the California Desert Conservation Area Plan, as it had been formally amended since 1980, modified by previous consultations related to grazing in the western Mojave Desert, modified by proposed interim conservation measures, and proposed to be modified by the Northern and Eastern Mojave Desert Management Plan and Northern and Eastern Colorado Desert Coordinated Management Plan, was not likely to jeopardize the continued existence of the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), or arroyo toad (*Bufo californianus*) (Service 2002b).

By memorandum dated March 17, 2003 (Bureau 2003d), the Bureau requested the Service's concurrence, pursuant to section 7(a)(2) of the Act, that the proposed designation of routes of travel in the western Mojave Desert was not likely to adversely affect the desert tortoise, the listed carbonate plants, and their critical habitats (i.e., Parish's daisy and the endangered Cushenbury oxytheca (*Oxytheca parishii* var. *goodmaniana*), Cushenbury milk-vetch, and Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*)). By memorandum dated April 7, 2003 (Bureau 2003e), you requested our concurrence that the proposed designation of routes of travel in the western Mojave Desert was not likely to adversely affect Lane Mountain milk-

vetch. In these memoranda, you also requested our concurrence that the proposed designation of routes of travel would not affect the bald eagle (*Haliaeetus leucocephalus*), least Bell's vireo, southwestern willow flycatcher, California red-legged frog (*Rana aurora draytonii*), arroyo toad, Mohave tui chub (*Gila bicolor mohavensis*), and triple-ribbed milk-vetch (*A. tricarinatus*). (The bald eagle and California red-legged frog are federally listed as threatened; the Mohave tui chub and triple-ribbed milk-vetch are listed as endangered.) On June 30, 2003, we responded, via memorandum that we concurred with your determinations for all of the species except for the desert tortoise and Lane Mountain milk-vetch. In the same document, we provided our biological opinion that the proposed designation of routes of travel in the western Mojave Desert was not likely to jeopardize the continued existence of the desert tortoise or Lane Mountain milk-vetch or adversely modify the critical habitat of the desert tortoise (Service 2003a).

On September 25, 2003, we issued a biological opinion in which we concluded that the California Desert Conservation Area Plan, as it had been formally amended since 1980, modified by previous consultations related to grazing in the western Mojave Desert, and modified by proposed interim conservation measures, was not likely to jeopardize the continued existence of the carbonate plant species or adversely modify their critical habitat (Service 2003b).

By memorandum dated October 17, 2003, we concurred with your determinations that the California Desert Conservation Area Plan, as it had been formally amended since 1980, modified by previous consultations related to grazing in the western Mojave Desert, and modified by proposed interim conservation measures, was not likely to adversely affect the threatened Inyo California towhee (*Pipilo crissalis eremophilus*) and bald eagle and the endangered Yuma clapper rail (*Rallus longirostris yumanensis*) and Mohave tui chub. On September 8, 2003, the Service withdrew its proposal to list the mountain plover (*Charadrius montanus*) as an endangered species; consequently, we notified you via memorandum that we would not consider this species in our evaluation of your determination (Service 2003c).

On May 27, 2003, the plaintiffs (joined by Desert Survivors) filed a related lawsuit in U.S. District Court, Northern District of California against the Bureau and the Service challenging issuance of the June 17, 2002, biological opinion and implementation of the California Desert Conservation Area plan (as amended). On June 20, 2003, the American Motorcycle Association District 37, Off-road Business Association, San Diego Off-road Vehicle Association, and Utah Shared Access Alliance filed a lawsuit in U.S. District Court, District of Utah against the Bureau and the Service for the alleged failure to implement the recovery plan for the desert tortoise. The suit was later transferred to the Northern District of California and amended to challenge the June 17, 2002, biological opinion.

In an August 3, 2004, order, the District Court held that the Service had relied on an invalid regulatory definition of "adverse modification" while analyzing effects to designated critical habitat in the June 17, 2002, biological opinion. The biological opinion was vacated and remanded to the Service with instructions to reissue the biological opinion after applying the appropriate definition of adverse modification, which the District Court defined as "a direct or

indirect alteration of critical habitat which appreciably diminishes the value of that habitat for either the survival or recovery of a listed species.”

The District Court responded to the defendants’ and plaintiffs’ subsequent motions to alter or amend the judgment and for injunctive relief, respectively, in a December 30, 2004, order that, among other things, no longer prescribes a specific definition for adverse modification but adopts the following language amending the August 3, 2004, order:

The Court finds, for example, that a proper definition of “destruction or adverse modification” would be “a direct or indirect alteration of critical habitat which appreciably diminishes the value of that habitat for either the survival or recovery of a listed species.” The Court hereby vacates and remands the biological opinion to the Service to reconsider its biological opinion of the (California Desert Conservation Area) Plan in light of the appropriate standard.

Proposed Critical Habitat of Lane Mountain Milk-Vetch

Subsequent to your original request for formal consultation on the West Mojave Plan, the Service published a proposed rule to designate critical habitat for Lane Mountain milk-vetch (69 *Federal Register* 18018). By memorandum dated August 20, 2004, the Bureau requested formal conference, pursuant to section 7(a)(4) of the Act, with regard to proposed critical habitat of Lane Mountain milk-vetch (Bureau 2004a). However, on April 8, 2005, we published a final rule that did not designate any critical habitat (70 *Federal Register* 18220). Consequently, we will not address your request for formal conference regarding proposed critical habitat of Lane Mountain milk-vetch in this biological opinion.

Other Listed Species within the West Mojave Planning Area

In your request for formal consultation, you also requested our concurrence that the proposed action is not likely to adversely affect the Inyo California towhee or its critical habitat. As noted in the previous paragraph, we concurred with your determination that the California Desert Conservation Area Plan, as it had been formally amended since 1980, modified by previous consultations related to grazing in the western Mojave Desert, and modified by proposed interim conservation measures, was not likely to adversely affect the Inyo California towhee or its critical habitat. The proposed action does not change the management of the lands upon which this species occurs; consequently, we again concur with your determination that the proposed action is not likely to adversely affect the Inyo California towhee or its critical habitat. We note that the Bureau has proposed to remove invasive plant species, such as tamarisk (*Tamarix* spp.) and common reed (*Phragmites australis*) over time at 11 springs in the Great Falls Basin Area of Critical Environmental Concern. It will also monitor Peach Springs in the Argus Mountains Wilderness to ensure that burros are not damaging habitat. These actions, in general, would benefit the Inyo California towhee; the Bureau will consult with the Service, pursuant to section 7(a)(2) of the Act, at the time specific actions are implemented, if appropriate.

You also requested our concurrence that the proposed action is not likely to adversely affect the Cushenbury buckwheat and Cushenbury oxytheca or the critical habitat of these carbonate plant species. Through the West Mojave Plan, the Bureau will create an area of critical environmental concern for the Cushenbury oxytheca and Cushenbury buckwheat and will designate all the roads therein as limited (to use by claimholders only). The Bureau also proposes a land exchange with the Cushenbury Mine Trust to attempt to acquire lands within the area of critical environmental concern that support both the Cushenbury oxytheca and Cushenbury buckwheat. The only occurrence of Cushenbury oxytheca within the California Desert Conservation Area is located on Cushenbury Mine Trust lands near the boundary with the San Bernardino National Forest east of Highway 18. The new area of critical environmental concern would protect on public lands at least 5 polygons totaling 160 acres of Cushenbury buckwheat. An additional 160 acres of the Cushenbury buckwheat are located on the Cushenbury Mine Trust lands that the Bureau hopes to acquire by exchange. Acquired lands will not be opened to mineral entry. A land use standard of no surface disturbance to prevent undue degradation would apply within the area of critical environmental concern. Underground mining could be allowed; however, the Bureau must first approve a plan of operations. Because the only occurrences of the Cushenbury oxytheca and Cushenbury buckwheat within the California Desert Conservation Area would be protected by the measures proposed by the Bureau, we concur with your determination that the West Mojave Plan, as proposed, is not likely to adversely affect the Cushenbury oxytheca and Cushenbury buckwheat and their critical habitat.

The Bureau also determined that the proposed action will not affect the bald eagle, Yuma clapper rail, least Bell's vireo, southwestern willow flycatcher, mountain plover, California red-legged frog, Mohave tui chub, triple-ribbed milk-vetch, and Hoover's woolly-star. Bald eagles traverse the western Mojave Desert but do not winter on public lands or breed in this region. We acknowledge that the bald eagle will not be affected by the Bureau's programs because its occurrence on public lands within the planning area is transitory.

Yuma clapper rails were documented at Harper and East Cronese Dry Lakes over 23 years ago; Garrett and Dunn (1981) consider these locations to be "extralimital" or not within the normal range of the species. Consequently, because it has not been detected in the western Mojave Desert since the early 1980s and is not currently known to occur within the planning area, implementation of the West Mojave Plan will not affect the Yuma clapper rail.

We are not aware of southwestern willow flycatchers breeding on lands managed by the Bureau in the planning area (Service 2002b). Least Bell's vireos breed within the Big Morongo Canyon Area of Critical Environmental Concern (LaPre 2005i). Both species migrate through the western Mojave Desert and, during migration, could use any type of riparian habitat in the planning area in a transitory manner. The proposed action will not affect individuals of these species during migration because of their transitory presence at any given site within the planning area and because provisions of the proposed action are generally protective of riparian habitat throughout the planning area. The proposed action will not affect breeding least Bell's vireos at the Big Morongo Canyon Area of Critical Environmental Concern because the Bureau is not proposing any actions within this area in the West Mojave Plan; additionally, the focus of

the Bureau's management direction for this area of critical environmental concern is the conservation of wildlife, including particularly migratory songbirds.

As we noted previously in this document, the Service withdrew its proposal to list the mountain plover. The California red-legged frog and Mohave tui chub do not occur on lands managed by the Bureau. We published a final rule to remove the Hoover's woolly-star from the list of threatened and endangered species on October 7, 2003 (68 Federal Register 57829). Consequently, we will not discuss these species further in this document.

The triple-ribbed milk-vetch occurs on public lands in the planning area only within the Big Morongo Canyon Area of Critical Environmental Concern. The goal of this area of critical environmental concern is to protect the biological resources found in that area; consequently, little ground disturbance occurs within the area of critical environmental concern. Additionally, as part of the proposed action, the Bureau will require the proponents of any future action to avoid impacts to individuals and their habitat on public lands (section 2.2.4.10.22 in Bureau et al. 2005). For these reasons, the triple-ribbed milk-vetch will not be affected by implementation of the West Mojave Plan.

Finally, the endangered arroyo toad also occurs in the planning area, near Little Horsethief Creek, which eventually flows into the West Fork of the Mojave River; this area is located along the north slope of the San Bernardino Mountains. Although the Bureau did not address this species in its request for consultation, the final environmental impact report and statement notes that the multiple use classification of 1,814 acres of public land will be changed from unclassified to Class M. (Note that the final environmental impact report and statement also states that this change would affect lands designated as critical habitat for the arroyo toad; however, in a final rule dated April 13, 2005, the Service did not include these lands within the boundaries of critical habitat (70 *Federal Register* 19562).) We have addressed the potential effects of the California Desert Conservation Area Plan on the arroyo toad in a previous biological opinion (Service 2002b). The only proposed change in the West Mojave Plan from the management direction analyzed in that consultation is the change in multiple use classification. The former unclassified designation would have allowed the Bureau to dispose of this land for any purpose. Under the Class M designation, the Bureau will be able to offer these lands to a public agency, such as the California Department of Parks and Recreation, for a Recreational and Public Purposes lease; the lessee will then manage the lands for the conservation of the arroyo toad. Consequently, this proposed amendment of the California Desert Conservation Area Plan is not likely to adversely affect the arroyo toad.

For the various reasons cited in the preceding paragraphs, we will not consider any of the species discussed in this section further in this biological opinion.

Review of the Draft Biological Opinion

We provided a draft biological opinion for your review on August 16, 2005. We received your comments on the draft document by memorandum, dated November 4, 2005. We have incorporated your comments into this final biological opinion, as appropriate.

BIOLOGICAL OPINION

This biological opinion does not rely on the regulatory definition of “destruction or adverse modification of critical habitat” at 50 *Code of Federal Regulations* 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

Note that, during the development of this biological opinion, the Service requested clarification from the Bureau regarding several aspects of the proposed action in relation to the areas within and outside of desert wildlife management areas and critical habitat; we also conducted additional analyses using our GIS layers. Given the variations in data used in the various GIS layers and the numerous actions under consideration in this consultation, the resulting calculations occasionally presented variations in results; these variations may occasionally appear in this biological opinion. Although a few numbers may vary to some degree, the differences are minor and do not affect the basic outcome of any analysis.

DESCRIPTION OF THE PROPOSED ACTION

Purpose and Function of the California Desert Conservation Area Plan

Congress designated the California Desert Conservation Area under the authority of section 601(c) of the Federal Land Policy and Management Act of 1976. To provide for management of recreational use and to resolve other resource and public land use conflicts, the Federal Land Policy and Management Act also directed the Secretary of the Interior to “prepare and implement a comprehensive, long-range plan for management, use, development, and protection of the public lands within the California Desert Conservation Area.” The purpose, as specified by Congress, was “to provide for the immediate and future protection and administration of the public lands in the California Desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality.” The California Desert Conservation Area Plan was signed in January 1980 and now serves as the primary document that describes the basic management principles the Bureau uses for managing its portion of the California Desert Conservation Area. Since its adoption, the Bureau has completed 12 major amendments to the California Desert Conservation Area Plan.

The California Desert Conservation Area Plan employs three basic tools for managing resources in the California Desert Conservation Area. These tools are:

1. Four multiple-use classes are the basis of a land zoning system that allows for a variety of uses and resource conservation activities. Class C lands are those that have been formally designated as wilderness by Congress; it is also used for lands that are being recommended for wilderness designation. Lands within Class L (limited use) include areas that are managed to provide for lower density, carefully controlled multiple uses of resources while ensuring that sensitive values are not significantly diminished. Lands within Class M (moderate use) include areas that are managed to provide for a wide variety of present or future uses that include mining, livestock grazing, recreation,

energy, and utility development. The purpose of Class I (intensive use) lands is to provide for concentrated use of lands and resources to meet human needs (Bureau 1999).

2. The following twelve California Desert Conservation Area Plan elements provide detailed treatments and prescriptions addressing the management of different land uses and resources: cultural resources; Native American; wildlife; vegetation; wilderness; wild horse and burro; livestock grazing; recreation; motorized-vehicle access; geology, energy and mineral; energy production and utility corridors; and land-tenure adjustment.
3. The designation of special management areas, including, but not limited to special areas and areas of critical environmental concern, which require “special management attention ... to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.”

The California Desert Conservation Area Plan (Bureau 1999) contains detailed descriptions of the multiple-use class guidelines and elements that the Bureau uses to direct its management of public lands in the California desert. Our previous biological opinions on the effects of the California Desert Conservation Area Plan, as amended and proposed for amendment, describe the effects that the implementation of these multiple-use class guidelines and elements may have on the listed species and their critical habitat in the California desert. These multiple-use class guidelines and elements do not describe specific, on-the-ground actions; with the exception of casual use, all future actions that the Bureau may propose under the program direction of the California Desert Conservation Area Plan are subject to the consultation requirements of section 7(a)(2) of the Act. Because we have analyzed the potential effects of these multiple-use class guidelines and elements in previous biological opinions and because these multiple-use class guidelines and elements would not change as a result of approval of the West Mojave Plan, we will not repeat these descriptions and analyses herein. Instead, we will focus our analysis on the changes in land uses that the Bureau has proposed as part of its plan amendments for the western Mojave Desert.

Alternative B of the West Mojave Plan

The Bureau requested consultation on alternative B, as described in the draft environmental impact report and statement (Bureau 2003c, Bureau et al. 2003). This alternative consists of the elements of alternative A that are applicable to and can be implemented on Bureau-administered lands. Under alternative A, non-federal entities within the planning area would apply for an incidental take permit, pursuant to section 10(a)(1)(B) of the Act, for activities that would occur without a Federal nexus; if the Service consequently issues an incidental take permit to local agencies, alternative A of the West Mojave Plan would be implemented. The Bureau issued the final environmental impact report and statement (Bureau et al. 2005) before we completed the biological opinion; consequently, where the final environmental impact report and statement differed from the draft document, we altered the proposed action described in this biological opinion to correspond to the Bureau’s current proposal.

The essence of the Bureau's component (alternative B) of the West Mojave Plan is the adoption of an amendment to the California Desert Conservation Area Plan. (Note that the environmental impact report and statement describes the various actions the Bureau proposes to undertake as separate amendments; however, any changes to the California Desert Conservation Area Plan that result from the West Mojave Plan will be considered a single amendment to the California Desert Conservation Area Plan. We have maintained the discussion of the 11 amendments in this biological opinion to be consistent with the environmental impact report and statement.) We will describe the portions of these amendments that pertain to the species under consideration in this biological opinion in detail in the following sections; that is, if a species does not occur in an area that would be affected by the amendment, we will not discuss that species in relation to the amendment. The titles of the amendments are derived from Table 2-2 of the final environmental impact report and statement (Bureau et al. 2005).

Amendment 1, New Areas of Critical Environmental Concern. The Bureau will designate 14 new areas of critical environmental concern to conserve listed species, sensitive species, and areas that protect groups of species or important habitat. The new areas of critical environmental concern and the amount of land, in acres, currently managed by the Bureau in those areas that occur within areas that may be inhabited by the desert tortoise and listed carbonate plants are:

- Fremont-Kramer Desert Wildlife Management Area (1,023,329 – includes all four desert wildlife management areas)
- Superior-Cronese Desert Wildlife Management Area
- Ord-Rodman Desert Wildlife Management Area
- Pinto Mountain Desert Wildlife Management Area
- Bendire's Thrasher Conservation Area (28,046)
- Carbonate Endemic Plants Research Natural Area (4,393)
- Coolgardie Mesa Conservation Area (10,107)
- Mojave Monkeyflower Conservation Area (36,630)
- West Paradise Conservation Area (257)
- Parish's Phacelia Conservation Area (512)
- Pisgah Conservation Area (14,224)

The Coolgardie Mesa, West Paradise, and Parish's Phacelia conservation areas are located within the Superior-Cronese Desert Wildlife Management Area and the Superior-Cronese critical Habitat Unit of the desert tortoise. Desert tortoises likely occur in very low numbers within and immediately surrounding the Parish's Phacelia Conservation Area, which is centered around a series of small dry lakes. The primary constituent elements of critical habitat are not well represented in this conservation area because substrates are either high in clay content or rocky, portions of the area flood, and perennial vegetation is sparse or absent. Therefore, the management prescriptions associated with this conservation area are not likely to benefit the desert tortoise. The other two conservation areas support higher quality habitat and greater numbers of desert tortoises. Consequently, the management prescriptions for these areas, such as withdrawal from mineral entry, could benefit desert tortoises on a local basis. Because the effects of the management prescriptions for these conservation areas are entirely beneficial to the

desert tortoise and its critical habitat, we will not discuss these conservation areas further in this biological opinion.

We recognize that the Bureau has, in the final environmental impact report and statement, proposed establishment of the desert wildlife management areas and conservation areas as part of its amendments; until the Bureau signs a record of decision on the proposed amendment to the California Desert Conservation Area Plan, these areas will remain proposed. To simplify the writing of our biological opinion, we have not inserted the word “proposed” prior to each use of the phrases “desert wildlife management area” and “conservation area” in reference to the conservation areas being proposed by the Bureau as part of the West Mojave Plan.

The following description of special management areas, such as areas of critical environmental concern or research natural areas, is summarized from the California Desert Conservation Area Plan (Bureau 1999). Normally, after an area has been formally designated as a special management area, a site-specific activity plan is prepared that clearly identifies the ongoing management objectives for the area. The activity plans for the new special management areas, mentioned previously, are described in the final environmental impact report and statement and appendices.

Development, when wisely planned and properly managed, may occur in areas of critical environmental concern if the basic intent of protection of historic, cultural, scenic, or natural values is ensured. In the interests of certain wildlife and cultural resources, surface disturbances from mining, motorized-vehicle access, and grazing or other uses will be controlled. In some cases, fencing may be used to prevent unintentional impacts. Fencing may also be used to reduce or eliminate competition for water sources or forage to benefit particular species of wildlife. Some valuable wildlife resources may require assistance in the way of habitat restoration or enhancement. Directional signs and visitor use areas will be developed and designated to encourage visitor cooperation, and informational facilities and interpretive programs will be instituted to increase visitors’ knowledge of and sensitivity to the need to protect important natural and cultural resource values. Consultation with the adjacent land owners will be conducted when management of an area of critical environmental concern conflicts with adjacent owners’ land uses and requirements (Service).

Management prescriptions for areas of critical environmental concern may override the multiple-use class guidelines for the local area. The Bureau monitors existing conditions within an area of critical environmental concern to ensure that resource degradation is not occurring. Monitoring data will be used to guide corrective actions that may be necessary.

We have included detailed discussions only of the special management areas that occur within the ranges of the listed species under consideration in this biological opinion and provide conservation benefits to these species and their habitats. The environmental impact report and statement contains greater detail on and maps of the special management areas.

The desert wildlife management areas for the desert tortoise will be managed for the conservation and recovery of this species until it is delisted pursuant to the criteria described in

the recovery plan. Multiple use classes within the desert wildlife management areas will be changed to Class L. We described other changes in multiple use classes within desert tortoise habitat in the section of this biological opinion on amendment 3.

An important component of the Bureau's management of these desert wildlife management areas is the establishment of a one percent threshold for new ground disturbance for the 30-year life of the plan. New ground disturbance includes any clearing, excavating, grading or other manipulation of the terrain, whether or not a permanent use is proposed for the site. The final environmental impact report and statement notes that, if the Bureau exceeds its allowable ground disturbance, it may be required to conduct individual consultations, pursuant to section 7(a)(2) of the Act, for all future actions. In fact, although we will work with the Bureau to attempt to develop expedited means of conducting future consultations, the regulations that implement section 7(a)(2) of the Act and recent court cases clearly indicate that the Bureau will need to continue to consult on individual projects. If the Bureau exceeds its allowable ground disturbance, it may be required to re-initiate formal consultation, pursuant to section 7(a)(2) of the Act, on the California Desert Conservation Area Plan for the western Mojave Desert planning area, as required by 50 *Code of Federal Regulations* 402.16.

The Bureau will track the amount of new ground disturbance within each conservation area. (Many features of the West Mojave Plan apply to all conservation areas, although the specific names of these areas may vary (e.g., desert wildlife management area, conservation area, research natural area); therefore, in the preceding sentence, the concept of 'allowable ground disturbance' applies to all conservation areas and the specific amount of allowable ground disturbance for the desert tortoise desert wildlife management areas is 13,000 acres. Simply stated, all desert wildlife management areas are also conservation areas, but not all conservation areas are desert wildlife management areas.) The baseline acreage for the allowable ground disturbance will be adjusted if land transfers from one agency to another.

The Bureau will apply a mitigation fee to new ground-disturbing activities that may occur on its lands. The Bureau will require applicants for permits to compensate for all new land disturbance at the time the permit is issued. The fee would not be additive where multiple species exist on site or where conservation areas for species overlap. The fee would be based on the average value of an acre of land within the habitat conservation area. Within conservation areas, the compensation ratio will be 5:1; that is, for each acre of land disturbed, the project proponent would provide five times the average value of an acre of land. Outside of the conservation areas on lands delineated as disturbed habitat, the ratio will be 0.5:1. Within all other areas outside of the habitat conservation area, the ratio will be 1:1. Table 2-7 and Map 2-8 of the environmental impact report and statement display the criteria used to delineate disturbed habitat and areas where the three compensation ratios apply, respectively. Table 2-9 of the environmental impact report and statement describes minor exceptions to the requirement for compensation on the Bureau's lands. Grazing is not considered a new ground-disturbing activity.

The Bureau will manage compensation fees collected on its lands; it will maintain the fees in a special account established for the acquisition of mitigation lands within the habitat conservation area. Appendix C and section 2.2.4.1 of the environmental impact report and statement identify

priorities for the acquisition of land within the conservation areas. These funds could also be expended on other implementation measures established by the West Mojave Plan. Appendix C also lists these measures and provides an initial prioritization for their implementation.

Fire Management. The Bureau has not proposed any changes in the manner in which it manages fire in the western Mojave Desert. Because this element was evaluated in previous biological opinions on the California Desert Conservation Area Plan, we will not discuss this issue further in this document (Service 2003b [Parish's daisy and Cushenbury milk-vetch], 2002c [Lane Mountain milk-vetch], 2005c [desert tortoise]).

Land Acquisition within Habitat Conservation Areas. The Bureau will seek to maintain existing public lands in an unfragmented state and to acquire private land within conservation areas. The environmental impact report and statement describes the variables the Bureau will consider when attempting to acquire land. In some cases, conservation easements may be used as an alternative to acquisition. After acquisition of a parcel of private land, the Bureau will designate routes, monitor biological resources, and implement other appropriate management actions, pursuant to the provisions of the California Desert Conservation Area Plan. Lands that are acquired to promote the conservation of the species considered in the West Mojave Plan will not be opened to mineral entry. Because the acquisition of lands within a conservation area will not adversely affect desert tortoises, Lane Mountain milk-vetch, Parish's daisy, or Cushenbury milk-vetch or their designated critical habitat, we will not discuss it further in this biological opinion.

The Bureau will adopt a standard of no surface occupancy to prevent undue and unnecessary degradation of lands, under the surface mining regulations, within the Carbonate Endemic Plants Area of Critical Environmental Concern. Public lands within the Coolgardie and West Paradise conservation areas will be withdrawn from mineral entry, subject to valid existing rights.

In other areas, access for mining exploration, conducted in accordance with the General Mining Law of 1872, will be limited to public roads and designated open routes unless otherwise permitted under a plan of operations approved by the Bureau. Drilling to explore for minerals and the development of access routes to drill sites will be considered as temporary disturbances. If the access route is closed within 120 days of the beginning of surface-disturbing activities, all activities are appropriately monitored to minimize impacts as they occur, and any surface disturbance at the drill site is reclaimed, these activities would not be counted against the one percent allowable ground disturbance for the conservation areas.

Native Plant Harvesting. The harvesting of native plants will not be allowed within conservation areas. This prohibition does not include salvage of plants from ground-disturbing activities, collection of seeds or propagules for restoration, eradication of non-native weeds, or research. Outside of the conservation areas, plant harvesting will be regulated in accordance with the California Desert Native Plant Protection Act.

Recreation. No vehicle speed events will be allowed in the portions of the conservation area that lie within the desert wildlife management areas and the Mohave Ground Squirrel Conservation

Area. The Bureau will continue to implement the existing biological opinion on dual sport events, subject to the following guidelines:

1. Dual sport events would be allowed seasonally in desert wildlife management areas, including the Rand Mountains. Dual sport events will be allowed from November 1 to March 1 while most desert tortoises are inactive. Existing education materials will be supplemented to indicate that very young desert tortoises may be encountered during the fall and winter and should be avoided; this information will be provided to participants at the time of the event.
2. Dual sport events in those portions of the Mohave Ground Squirrel Conservation Area outside of the desert wildlife management area will be allowed from September through February only. The prescriptions described in the biological opinion for desert tortoises will apply.
3. Dual sport events outside of desert wildlife management areas and the Mohave Ground Squirrel Conservation Area would be allowed year-round. Within the Pisgah and Carbonate Endemic Plants areas of critical environmental concern, specific stipulations, to be developed at the time of event application, will apply.
4. The Bureau will revise its educational materials provided to dual sports participants to indicate that both adult, and particularly hatchling, desert tortoises may be active at Thanksgiving and riders should watch for and avoid such animals.

Because the Bureau will limit vehicle events to designated open routes, we do not anticipate that they will affect the listed plant species or their designated critical habitat being considered in this biological opinion. Consequently, we will not discuss this topic in relation to these species again in this biological opinion.

Minimum impact recreation (e.g., hiking, equestrian uses, bird watching, photography, etc.) would be allowed within the conservation areas.

Wildlife Water Sources. Existing springs, seeps, and artificial water sources (guzzlers, drinkers, tanks) would remain in place. Water sources at natural springs and seeps will not be diverted and native riparian vegetation will not be removed to create artificial water sources for wildlife. The Bureau, Service, California Department of Fish and Game, and non-profit organizations, such as Quail Unlimited, would be allowed access to the waters for maintenance and for removal of invasive vegetation, subject to existing restrictions (e.g., vehicle travel in wilderness areas). Retaining livestock water sources would be at the discretion of the grazing permittee.

These activities will not affect the listed plant species or designated critical habitat addressed in this biological opinion. We are unaware of any springs or guzzlers within the range of Lane Mountain milk-vetch. Springs and artificial waters are more likely to occur within the ranges of Parish's daisy and Cushenbury milk-vetch because of the terrain these species inhabit. However, the proposed management direction should not affect these species for several reasons. First,

these species do not occur in wetland or riparian areas and the Bureau's proposed management direction indicates that natural waters will not be diverted or its surrounding vegetation removed. Second, Dove Springs is the only water source in this area that has been developed for cattle. The area immediately adjacent to Dove Springs is already disturbed to a degree that the listed plant species are not present; additionally, the Bureau has fenced critical habitat of the carbonate species to exclude cattle. For these reasons, we will not discuss management direction with regard wildlife water sources and listed plant species again in this biological opinion.

Commercial Activities. Commercial activities, such as commercial filming that result in ground disturbance or adverse effects, are allowed in the desert wildlife management areas but only if the project proponent applies measures to avoid killing desert tortoises that are applicable to temporary construction impacts. The Bureau has not proposed any changes to its current management of filming activities; these measures are summarized in appendix C of the final environmental impact report and statement. In addition, the following measures will apply:

1. The Bureau will develop a brochure, to be provided to the proponent, showing the boundaries of the desert wildlife management areas and areas where higher densities of desert tortoises occur within the desert wildlife management areas that should be avoided, as far as possible.
2. Where filming activities may occur equally well on alternative sites, the Bureau will direct proponents to lands outside desert wildlife management areas. Within desert wildlife management areas, the Bureau will direct proponents to areas that support lower densities of desert tortoises.
3. Preplanning, including implementation of the preceding measures, will rely on the expertise of the Bureau's biologists to help the location manager choose sites where filming would have the least impact on desert tortoises.

Domestic Dogs. Dogs would be allowed off leash if they are accompanied by and under the control of their owners. Off-leash dogs will be prohibited in some situations (e.g., construction sites in desert wildlife management areas).

Highway Construction and Maintenance. The Bureau will encourage proponents who wish to construct new roads or railroads to locate them outside of desert wildlife management areas. The final environmental impact report and statement suggests that seasonal restrictions for maintenance activities may be appropriate; that is, on public lands, road work should be restricted to the period from November 1 through February 1. The final environmental impact report and statement also notes that roadbeds should not be lowered and berms should not exceed 12 inches in height or a slope of 30 degrees. Invasive weeds will not be used in landscaping within or adjacent to desert wildlife management areas. These measures are likely to protect desert tortoises, the listed plant species, and their habitats to some degree. We will not consider these measures further in this biological opinion, however, because they do not constitute specific management practices, in and of themselves. The degree to and manner in which they are implemented will be determined during the planning of specific projects.

Hunting and Shooting. Hunting is regulated by State law; the Bureau cannot regulate hunting. Consequently, we will not discuss this issue further in this biological opinion.

The shooting or discharge of firearms would generally be permitted on public lands except in specified areas (e.g., off-highway vehicle management areas), as long as State and local laws permit such activity. On public lands within desert wildlife management areas, the only firearm discharges allowed would be during hunting season in pursuit of game and target practice using retrievable targets, such as paper targets.

Utility Construction and Maintenance. The Bureau will review new linear utility projects within conservation areas at the time they are proposed. The Bureau will consider the following guidelines, which have been modified slightly from those contained in the draft environmental impact report and statement as a result of discussions with the Service during consultation:

1. To the degree possible, new utility right-of-ways in designated, active, and contingent corridors will be situated as close together as practical, given engineering specifications, human safety, and other limiting factors.
2. If at all possible, future utilities will be located in an alternative corridor rather than Corridor Q.
3. Within existing corridors, already disturbed areas will be used, if possible.
4. Pipelines within desert wildlife management areas will be revegetated after installation. Construction rights-of-way will be narrowed, to the degree possible, in all management areas.
5. In desert wildlife management areas, the effects of ground disturbance caused by projects will be restored in a manner that: (a) stabilizes soil surfaces control erosion by wind and water; (b) minimizes or eliminates future vehicle use in areas to be revegetated; (c) minimizes or eliminates future vehicle use of adjacent, undisturbed areas; (d) curtails the spread of exotic weeds; and (e) provides habitat for the target species.
6. The Bureau or its appointee will develop a standardized revegetation plan and apply it equitably throughout desert wildlife management areas. The revegetation plan will clearly state goals, methods based on the best available scientific information, and success criteria that are realistic for desert restoration. A technical advisory team of regulatory personnel, restoration experts, knowledgeable utilities personnel, and others will be assembled to devise and write guidelines for a standardized revegetation plan.

The measures proposed by the Bureau with regard to the construction and maintenance of utilities should generally function to reduce the adverse effects of these actions on the desert tortoise and its critical habitat. The specific measures to be used will be determined by the Bureau and other responsible agencies at the time specific actions are proposed. For this reason and because we have evaluated the general effects of the construction and maintenance of

utilities in the biological opinion for the California Desert Conservation Area Plan (Service 2005c), we will not discuss this issue further in this biological opinion. Note that the Service and Bureau have consulted on the operation and maintenance on a programmatic basis for several pipelines; these biological opinions will remain in effect unless specifically modified through re-initiation of formal consultation, pursuant to 50 *Code of Federal Regulations* 402.16.

No utility corridors are located within the occupied or critical habitat of the three listed plant species within the action area. Consequently, we will not discuss this portion of the West Mojave Plan in relation to these species again in this biological opinion.

Surveys for Desert Tortoises. Presence-absence surveys and clearance surveys will be required for all actions on all public lands within desert wildlife management areas. The former surveys are used to determine whether desert tortoises may be present at a project site; the latter are used to remove desert tortoises from areas where they may be killed or injured during implementation of a project. Outside of desert wildlife management areas, the Bureau will require only clearance surveys to be conducted.

Standard guidelines for handling (Desert Tortoise Council 1999) and disposing of (Berry 2003) desert tortoises will be implemented. We will not repeat the provisions of these protocols here because they have been reviewed previously by Service staff and have been in wide use for years.

Best Management Practices for Construction Projects. The final environmental impact report and statement contains descriptions of the measures that the Bureau and any project proponents it authorizes will undertake to reduce the adverse effects of construction activities on the desert tortoise and its habitat. In general, these measures reflect the current management strategy employed by the Bureau. Additionally, individual reviews of projects as they are proposed will allow for modification of these procedures, as necessary and appropriate. Consequently, we will not discuss these guidelines further in this biological opinion.

Disease. The environmental impact report and statement notes that “(i)ssues related to disease would be considered at the level of the interagency desert tortoise Management Oversight Group.” The environmental impact report and statement also suggests a strategy to manage disease; however, the Bureau notes that “(i)mplementation of the [program to manage disease] would occur only after all other [desert] tortoise management programs established by [the West Mojave] Plan have been funded and implemented.”

The strategy includes provisions for control of vectors, such as installing boundary fences between desert wildlife management areas and urban areas, developing procedures to quarantine areas if disease is detected, and using headstarting or other procedures to re-introduce desert tortoises into areas where they are extirpated. It includes an education component to alert the public about incompatible human activities in the desert and the problems with releasing captive desert tortoises into the wild. The strategy would include the establishment of an emergency trust fund for use during epidemics. It includes a proposal to develop captive colonies to maintain the genetic heterogeneity of desert tortoises in the Western Mojave Recovery Unit.

The strategy calls for promoting the health of desert tortoises by improving habitat conditions through reducing the amount of ground disturbance, removing sludge and biosolids from near critical habitat, and providing supplemental food and water under experimental conditions. Monitoring would be implemented to determine if dust from mines, agricultural fields, the edges of roads, and disturbed playas is affecting desert tortoises; the health status of desert tortoises would also be monitored. Finally, research would be conducted on the epidemiology of diseases encountered in desert tortoises, the relationship of toxicants and disease, headstarting, transmission of diseases, and other disease-related topics.

The management and control of diseases that may be affecting desert tortoises are critical issues that must be resolved if the recovery is to occur. We note that most of the elements of the strategy proposed by the Bureau are highly experimental in nature (e.g., developing procedures to quarantine areas if disease is detected), will require additional approvals to implement (e.g., any headstarting program will need authorization under section 10(a)(1)(A) of the Act), or are beneficial in terms of habitat management (e.g., reducing the amount of ground disturbance). Consequently, we will not analyze this strategy further in this biological opinion.

The Bureau will sign or otherwise designate the boundaries of desert wildlife management areas to identify them and facilitate enforcement. The signs would be placed in specific areas, as needed. This action will benefit the conservation of desert tortoises and management of critical habitat by providing information to the public; a slight possibility exists that desert tortoises or their critical habitat may be affected during placement of the signs; however, this possibility is insignificant because such adverse effects are easily avoided. Consequently, we will not discuss this issue further in this biological opinion.

Headstarting. The Bureau proposed to implement a headstarting program in areas where desert tortoises have apparently been extirpated or their numbers substantially reduced. Any headstarting program for desert tortoises will require separate approval from the Service under the appropriate authorities of the Act. At the time someone requests our authorization for such a program, the Service will also consult internally, pursuant to section 7(a)(2) of the Act, regarding the effects of our potential authorization. Consequently, although headstarting may, at some point, be a mechanism we use to attempt to recover the desert tortoise, we will not consider it further in this biological opinion.

Law Enforcement. The Bureau would attempt to ensure more law enforcement rangers and maintenance workers are in the field; it will also attempt to focus their efforts on the conservation of biological resources. However, the Bureau cannot commit to any specific level of implementation at this time. For this reason, we will not analyze this portion of the West Mojave Plan further in this biological opinion.

Predation by Common Ravens. The Bureau has proposed numerous actions that are designed to reduce predation on desert tortoises by common ravens. These measures include habitat modifications to reduce roosting and nesting opportunities on artificial structures, lethal control of problem individuals, and reducing the overall number of common ravens in selected areas.

Weed Abatement. The Bureau will cooperate with known specialists and organizations (including the Kern County Weed Management Agency, the Mojave Desert Resource Conservation District, and the California Exotic Pest Plant Council) to fund, coordinate, encourage, implement, and facilitate programs that contribute to the conservation of the desert tortoise and other listed species in the planning area. If successfully implemented, a program to control weeds would benefit the desert tortoise and improve the function of critical habitat by reducing the abundance of non-native species that are of little or no value and increasing the abundance of important forage plants. Future implementation of such a program, however, depends upon additional research, acquisition of funds and other factors; consequently, because the potential future actions have not been defined on any fundamental level, we will not discuss this issue further in this biological opinion.

Other Measures. The Bureau will require a study to determine if desert tortoises are being killed in quail guzzlers in the Western Mojave Recovery Unit. If the mortality level is considered unacceptable, a study would be designed to determine the best method of eliminating entrapment of desert tortoises while not impairing the function of the guzzler.

Amendment 2, New Boundaries of Existing Areas of Critical Environmental Concern. The boundary of the Afton Canyon Area of Critical Environmental Concern would be expanded by 3,840 acres and 480 acres would be deleted; the size of the expanded area of critical environmental concern will be 8,160 acres. The motorized vehicle access network of the California Desert Conservation Area Plan will be adopted as the network of vehicle access routes for the area of critical environmental concern. All lands within the expanded boundary will be withdrawn from mineral location and entry. These actions are likely to benefit the desert tortoise to some degree. The Afton Canyon Area of Critical Environmental Concern is located in the Cady Mountains. Desert tortoises occur in the Cady Mountains at very low densities. Increasing the size of the area in which the management guidelines for areas of critical environmental concern would be implemented and reducing the potential for ground disturbance and vehicular traffic related to minerals would promote the conservation of the few desert tortoises in this area. The Afton Canyon Area of Critical Environmental Concern is not within critical habitat of the desert tortoise. Consequently, this proposal will not affect critical habitat of the desert tortoise.

The Western Rand Area of Critical Environmental Concern will be expanded by 13,120 acres. This action should benefit the desert tortoise and promote the conservation role and function of the Fremont-Kramer Critical Habitat Unit by increasing the size of the area in which the management guidelines for areas of critical environmental concern would be implemented. Maintenance of desert tortoises in this area of the western Mojave Desert is crucial because it provides a link between the Desert Tortoise Natural Area, which is managed primarily for the conservation of the species, and the remainder of the Fremont-Kramer Desert Wildlife Management Area; if desert tortoises cannot persist in the Western Rand Area of Critical Environmental Concern, the Fremont-Kramer Desert Wildlife Management Area would essentially be split into eastern and western components.

The effects of expanding the Afton Canyon and Western Rand areas of critical environmental concern on the desert tortoise (and its critical habitat, in the latter case) are entirely beneficial. Consequently, we will not discuss these actions again in this document.

Changes in the boundaries of the Barstow Woolly Sunflower and Harper Dry Lake areas of critical environmental concern would not affect listed species. These areas of critical environmental concern overlap only the range of the desert tortoise. The Barstow Woolly Sunflower Area of Critical Environmental Concern is completely included within desert wildlife management areas for the desert tortoise; therefore, its management would not alter that of the desert tortoise. The Harper Dry Lake Area of Critical Environmental Concern is located entirely within Harper Dry Lake, which does not normally provide habitat for desert tortoises. Consequently, we will not discuss these areas of critical environmental concern again in this document.

Amendment 3, Changes in Multiple-use Class Designations. The specific changes resulting from this amendment are as follows. We have included only those changes in multiple-use class that may affect listed species under consideration in this biological opinion.

Afton Canyon Area of Critical Environmental Concern. The multiple-use class designations will be changed from M to L on certain lands within the expanded area of critical environmental concern.

Bendire's Thrasher Area of Critical Environmental Concern. The Bureau will change the multiple-use class designations from M to L on 9,809 acres in the northern Lucerne Valley.

Carbonate Endemic Plants Area of Critical Environmental Concern. The Bureau will change the multiple-use class designations from M to L on 4,393 acres on the north slope of the San Bernardino Mountains.

Desert Tortoise Desert Wildlife Management Areas. The Bureau will change the multiple-use class designations from M to L on 365,485 acres and from U to L on 34,566 acres within the boundaries of the desert wildlife management areas.

Disposal Parcels in Inyo County. The Bureau will change the multiple-use class designations from M and L to unclassified on 6,828 acres in southern Inyo County. This area is partially within the range of the desert tortoise but outside of any desert wildlife management area.

West Mojave Land Tenure Adjustment Program. Under this program, the Bureau designated consolidation zones where it would attempt to acquire private lands and retain public lands, retention zones where it would retain public lands, and disposal zones where it would dispose of public lands. The Environmental Baseline for the Desert Tortoise and its Critical Habitat - Previous Consultations section of this biological opinion contains a more detailed discussion of the history and status of this program. As part of the West Mojave Plan, the Bureau will change the multiple-use class designation of unclassified lands within the current disposal zone that are adjacent to the existing retention zone to Class L. The primary areas where this measure would

affect desert tortoises are in the area around the junction of Highway 58 and Harper Lake Road, where the Bureau added approximately 12,503 acres to the retention area, and north of the El Mirage Off-highway Vehicle Management Area, where approximately 8,502 acres were added. Because the effects of this proposed action are beneficial to the desert tortoise and its critical habitat, we will not analyze this action further in this biological opinion.

Note that the adjustment to the West Mojave Land Tenure Adjustment Program contained in the West Mojave Plan constitutes a re-initiation of the consultation on the original program. By memorandum dated June 29, 1990, the Bureau indicated it would not acquire lands in the easternmost portion of the consolidation zone until a decision had been reached regarding the proposed expansion of the Department of the Army's Fort Irwin. The original biological opinion on the West Mojave Land Tenure Adjustment Program states that, should the expansion of Fort Irwin occur in this area, the Bureau would not be able to complete the land tenure adjustment project, as proposed, and that re-initiation of formal consultation would be required (Service 1990). Through Public Law 107-107, approximately 118,600 acres were added to Fort Irwin along its southwestern and eastern boundaries in 2002. Consequently, this biological opinion constitutes our revised biological opinion for the West Mojave Land Tenure Adjustment Program; it supercedes previous biological opinions (Service 1990, 1998) on the land tenure adjustment program in the western Mojave Desert.

Little San Bernardino Mountains Gila Habitat. The Bureau will change the multiple-use class designations from unclassified to M on 1,922 acres adjacent to Joshua Tree National Park.

Mojave Fishhook Cactus Area of Critical Environmental Concern. The Bureau will change the multiple-use class designations from unclassified to L on 628 acres south of Helendale.

Mojave Monkeyflower Area of Critical Environmental Concern. The Bureau will change the multiple-use class designations from unclassified and I to L on 10,633 acres in Brisbane Valley.

Mohave Ground Squirrel Conservation Area. The Bureau will change the multiple-use class designations from Class I to Class L on 5,391 acres east of Searles Dry Lake.

Non-Wilderness Class C. The Bureau must reclassify any lands that were not designated as wilderness through the California Desert Protection Act. Several of the parcels for which the Bureau proposes to change the multiple-use class do not support habitat of the desert tortoise and are not discussed herein. Four parcels may support desert tortoises (LaPre 2004b).

Near the Rodman Mountains Wilderness, small strips of land, totaling 242 acres, on the boundaries of the wilderness and the Red Top Cinder Mine "cherrystem" would be changed from multiple-use class C to L; this area is within the Ord-Rodman Critical Habitat Unit and Desert Wildlife Management Area. An additional 240 acres at the mine site, which has been disturbed by previous mining activities and is higher than 4,000 feet in elevation, would be changed from multiple-use class C to M; this area was excluded from the desert wildlife management area but is within the critical habitat unit.

The Bureau would change the multiple-use class from C to L on 219 acres near the Newberry Mountains Wilderness. The Bureau also proposes to change 50 acres from multiple-use class C to M. Both areas are almost entirely within the Ord-Rodman Desert Wildlife Management Area and Critical Habitat Unit.

The Bureau proposes to change the multiple-use class designation from C to L on 52 acres near the Golden Valley Wilderness, from C to M on 501 acres, and from C to I on 105. All of these are out of the Fremont-Kramer Desert Wildlife Management Area and Critical Habitat Unit. These areas may contain habitat for the desert tortoise and low numbers of animals.

Near the El Paso Mountains Wilderness, the Bureau proposes to change the multiple-use class designation from C to L on 362 acres. This area is not located within a desert wildlife management area or critical habitat unit. As in the case of Golden Valley, the area may support desert tortoises and their habitat.

Pisgah Area of Critical Environmental Concern. The Bureau will change the multiple-use class designations from M to L on 14,224 acres generally north of the Marines Corps Air Ground Combat Center.

Western Rand Area of Critical Environmental Concern. The Bureau will change the multiple-use class designation from Class M to L on 13,120 acres in the area between State Highway 395 on the east and the existing area of critical environmental concern on the west.

Amendment 4, Designation of the Mohave Ground Squirrel Conservation Area. The Bureau will establish a 1,308,877-acre conservation area for the Mohave ground squirrel (*Spermophilus mohavensis*). This area overlaps, to some degree, the Fremont-Kramer and Superior-Cronese critical habitat units of the desert tortoise. The conservation area also extends beyond the desert wildlife management areas to the north and west. This area will be managed under many of the same provisions that will apply in the desert wildlife management areas.

Amendment 5, Implementation of the Rand Mountains – Fremont Valley Management Plan. The Bureau will amend the California Desert Conservation Area Plan to implement the Rand Mountains – Fremont Valley Management Plan that was drafted in 1994. The changes to current management include expansion of the Western Rand Area Of Critical Environmental Concern by 13,120 acres, designation of the lands in the expanded area of critical environmental concern as Class L, the closure of the entire management area to off-highway vehicle use except for 129 miles of designated open routes, and categorization of a portion of the Rand Mountains - Fremont Valley Management Area as Category I habitat for the desert tortoise. The Bureau would also withdraw 32,590 acres within the Rand Mountains - Fremont Valley Management Area from mineral location and entry. The 6,090-acre Koehn Lake and an additional 8,320 acres within the management area would remain as Class I and open to mineral entry.

The Bureau has also proposed to require visitors to obtain a permit if they wish to use vehicles in the Rand Mountains. To obtain a permit, visitors would be required to complete a short

educational program and, once this is accomplished, could purchase a permit. The goal would be to increase compliance with applicable rules and regulations.

The Bureau's request for consultation on the proposed amendment of the California Desert Conservation Area Plan in this planning area also serves as re-initiation of formal consultation regarding the implementation of the Rand Mountains – Fremont Valley Management Plan. The Service and Bureau previously consulted on this management plan (Service 1992c, 1993a). This biological opinion also addresses the effects of the implementation of the management plan on the critical habitat of the desert tortoise.

Amendment 6, Afton Canyon Natural Area. We will discuss the adoption of an access network for routes as part of our analysis of Amendment 2. Therefore, we will not discuss Amendment 6 again in this biological opinion.

Amendment 7, West Mojave Land Tenure Adjustment Program. We will discuss proposed changes in the West Mojave Land Tenure Adjustment Program as part of our analysis of Amendment 3. Therefore, we will not discuss Amendment 7 again in this biological opinion.

Amendment 8, Adoption of Standards and Guidelines for Management of Grazing.

Standards and Guidelines. The Bureau will use regional standards and guidelines for public land health, the California Desert Conservation Area Plan, allotment management plans, and terms and conditions from existing biological opinions to manage livestock grazing. The standards express the level of physical and biological condition or degree of function required for healthy, sustainable public lands; the guidelines for grazing management are the types of activities and practices determined to be appropriate to ensure that the standards can be met or that substantial progress can be made towards meeting them. Section 2.2.5 of the final environmental impact statement (Bureau et al. 2005) contains a more complete discussion of standards and guidelines and how they relate to management of livestock. A standard is an expression of the level or physical and biological condition or degree of function required for healthy, sustainable rangelands. Guidelines are types of grazing management activities and practices determined to be appropriate to ensure that the standards can be met or significant progress can be made toward meeting them.

The standards for the West Mojave Plan include the management of substrates, native species, the function of riparian areas and wetlands, and water quality; the function of riparian areas and wetlands and water quality are not relevant to the desert tortoise or its critical habitat so we will not discuss them further in this biological opinion. Substrates should have infiltration rates and permeability rates that are appropriate for substrate type, climate, geology, land form, and past uses; the Bureau uses canopy and ground cover, the diversity of plant species, the amount of litter and organic matter, microbiotic soil crusts, evidence of wind or water erosion, and other factors to indicate whether the standards for substrates are being met. To determine whether standards for native species are being met, the Bureau evaluates photosynthetic and ecological processes, plant vigor, nutrient cycles, the production of litter, age class distribution of plants and animals, distribution and cover of plant species, and other factors. The guidelines for grazing

management are intended to maintain existing conditions, if the standards are being met, or to set management on a course toward improving conditions so that the standards can be met.

These standards and guidelines are generally compatible with the management of critical habitat of the desert tortoise because the standards provide descriptions for the physical and biological functioning that is appropriate for any given area of range and the guidelines establish management practices for grazing that either maintain habitat in good condition or seek to improve habitat quality where it is not functioning properly. Because the regional standards of public land health and guidelines for grazing management are designed to ensure the maintenance of high quality habitat or to improve the condition of habitat that is not functioning properly, we conclude that their implementation is not likely to adversely affect the desert tortoise or its critical habitat; consequently, we will not discuss them again in this biological opinion.

Only the Rattlesnake Canyon Allotment occurs within or near habitat occupied by the carbonate plants; Cushenbury milk-vetch does not occur in areas that are grazed (Bureau 2001). Additionally, the Bureau has constructed a boundary fence on the Rattlesnake Canyon Allotment to exclude from grazing from all areas occupied by Parish's daisy. As proposed by the Bureau, no livestock allotments overlap areas inhabited by the Lane Mountain milk-vetch. Consequently, Lane Mountain milk-vetch, Cushenbury milk-vetch, and Parish's daisy and the critical habitat of the latter two species are not likely to be adversely affected by livestock grazing; we will not discuss this activity further in this document.

Measures Regarding Specific Cattle Allotments. The Lacey-Cactus-McCloud Allotment boundary will be modified to exclude those portions that occur on the Naval Air Weapons Station, China Lake. Only the portion of the Lacey-Cactus-McCloud Allotment that was located within the Naval Air Weapons Station supported desert tortoises; because this portion of the allotment has been cancelled, desert tortoises will no longer be affected by grazing within this allotment. Therefore, we will not discuss the Lacey-Cactus-McCloud Allotment substantially again in this biological opinion.

The Valley Well Allotment occupies 524 acres east of Highway 247; it is authorized for 24 animal unit months and has been grazed 5 of the last 10 years. The Bureau's biologist recommended that it not be included in the Ord-Rodman Desert Wildlife Management Area because of its proximity to the base property of the rancher and its degraded condition (Chavez 2004). This allotment is within the boundaries of the Ord-Rodman Critical Habitat Unit. Because of the small size of the allotment, its degraded condition, and location adjacent to the heavily used Highway 247 and other human disturbances, we do not consider that it supports the primary constituent elements of critical habitat and will not discuss it further in this biological opinion.

Cattle Grazing within Desert Tortoise Habitat. The following prescriptions for management of livestock grazing will be implemented for all cattle allotments managed by the Bureau in the planning area that occur in desert tortoise habitat. The table in this general section of the biological opinion lists the relevant allotments. We note that the Bureau also states (page 2-126

of Bureau et al. 2005) that it will continue to ensure compliance with the terms and conditions of previous biological opinions that addressed grazing in the California Desert Conservation Area; we will not analyze the measures contained in those biological opinions further in this document.

All cattle carcasses found within 300 feet of a road or watering source will be removed and disposed of in an appropriate manner (i.e., not buried) within 2 days of being found or, if this is not practicable, such reasonable time as is acceptable to the Bureau's authorized officer. If the carcass is in a wilderness area or if it requires cross-country travel by a vehicle, the operator must obtain authorization from the Bureau prior to conducting this activity. Carcasses that are located more than 300 feet from a road or watering source will not be removed unless the Bureau determines they pose a health or safety hazard (Bureau 2005c).

New cattle guards will be designed and installed to prevent entrapment of desert tortoises. All existing cattle guards within suitable habitat will be modified within 3 years of adoption of the West Mojave Plan to prevent entrapment of desert tortoises.

Any hazards to desert tortoises that may be created, such as auger holes and trenches, will be eliminated before the rancher, contractor, or work crew leaves the site. This measure would serve to protect desert tortoises by reducing the likelihood that they would become trapped in hazards that are created during work on range improvements. Because it would be implemented as part of future specific actions that would undergo separate review by the Bureau and Service, we will not discuss it further in this biological opinion.

Grazing use will continue until a lessee voluntarily relinquishes all grazing use.

Cattle Grazing within Desert Wildlife Management Areas. The grazing prescriptions in this section will be implemented for all cattle allotments managed by the Bureau in the planning area that occur in desert wildlife management areas. The Cronese Lake, Harper Lake, Ord Mountain, and Pilot Knob allotments occur within desert wildlife management areas.

No ephemeral authorizations would occur in desert wildlife management areas. Allotments currently capable of authorizing ephemeral and perennial forage for cattle use will be designated for perennial forage use only. Therefore, the Pilot Knob Allotment would no longer be available for cattle grazing and all ephemeral production would be available for the conservation of the desert tortoise. Authorizations related to grazing activities (e.g., range improvements) on the Pilot Knob Allotment would be cancelled and the allotment designation would be removed from the California Desert Conservation Area Plan.

The Bureau will prohibit issuance of temporary non-renewable grazing permits in desert wildlife management areas for all lands below an elevation of 4,000 feet.

When ephemeral forage production is less than 230 pounds per acre, cattle will be substantially removed from portions of the allotment within the desert wildlife management areas referred to as "designated exclusion areas" (see Map 2-13 from the final environmental impact report and statement, Bureau et al. 2005) from March 15 to June 15. The designated exclusion areas

correspond to critical habitat of the desert tortoise. The term “substantially removed” recognizes that a few cattle might wander into the designated exclusion areas despite the operator’s best efforts and regardless of management facilities (e.g., fences, water sources) that are in place.

Cattle may remain past March 15 if ephemeral forage production is likely to surpass 230 pounds per acre. If this level of forage is not attained when weather conditions (e.g., warming of the soil) are appropriate, cattle must be substantially removed from designated exclusion areas until such time as 230 pounds per acre ephemeral forage is achieved or June 15, whichever is earlier. If cattle must be removed, the operator would be given 2 weeks to remove them from the designated exclusion area.

The Ord Mountain Allotment Management Plan will be revised after adoption of the West Mojave Plan. As part of the implementation of the revised allotment management plan, based upon available funding, range fences would be installed in two places to exclude cattle from areas of high concentration of desert tortoises along the southern boundary of the allotment, west of the Cinnamon Hills, and along the eastern boundary of the allotment, in the vicinity of Box Canyon. Excluding cattle from areas where desert tortoises occur in higher concentrations would be beneficial because the effects on individuals and on the primary constituent elements would be eliminated. Because the allotment management plan has not been developed to date, we will not analyze this proposed action further in this biological opinion. The Bureau and Service will consult on the allotment management plan, under the auspices of section 7(a)(2) of the Act, when appropriate.

Cattle Grazing outside of Desert Wildlife Management Areas. In all cattle allotments occurring in desert tortoise habitat outside of desert wildlife management areas, ephemeral authorization will only be granted when ephemeral production exceeds 230 pounds per acre.

Measures Regarding Specific Sheep Allotments. The Goldstone Allotment is located on lands that Congress transferred from the Bureau to the Army, in support of the expansion of Fort Irwin. Therefore, the Goldstone Allotment will no longer be grazed. Because this allotment is no longer within the action area of this consultation, we will not discuss it further in this biological opinion.

Grazing use in the Cantil Common, Bissell, Boron, Monolith-Cantil, Buckhorn Canyon, Spangler, Stoddard Mountain, Lava Mountains, and Rudnick Common allotments will continue until the lessee voluntarily relinquishes the grazing lease.

Sheep Grazing within Desert Tortoise Habitat. The following prescriptions for management of livestock grazing will be implemented for all sheep allotments managed by the Bureau in the planning area that occur in desert tortoise habitat. The table in this general section of the biological opinion lists the relevant allotments. We note that the Bureau also states (page 2-130 of Bureau et al. 2005) that it will continue to ensure compliance with the terms and conditions of the 1994 biological opinion (Service 1994d) regarding the grazing of sheep in the California Desert Conservation Area; we will not analyze the measures contained in that biological opinion further in this document.

Turnout of sheep in all allotments will not occur until 230 pounds per acre of ephemeral forage are available. The lessee will be required to remove sheep from the area or the entire allotment if production falls below 230 pounds per acre. This prescription is not applicable to those allotments that authorize sheep use of perennial forage.

Following the removal of lambs, multiple bands of sheep are typically combined. At this time, no more than 1,600 adult sheep will be allowed in a combined band.

Sheep Grazing within the Mohave Ground Squirrel and Mojave Monkeyflower Conservation Areas. The prescriptions in this section will be implemented on sheep allotments located within the Mohave Ground Squirrel and the Mojave Monkeyflower conservation areas. Unless otherwise noted, all prescriptions listed in the previous section for sheep allotments will also be implemented in these areas. The Cantil Common, Gravel Hills, Hansen Common, Lava Mountains, Monolith-Cantil, Rudnick Common, Shadow Mountain, Spangler Hills, and West and Middle Stoddard Mountain allotments will be affected by these prescriptions.

To avoid competition between sheep and the Mohave ground squirrel once the ephemeral forage is no longer available and both species are relying on perennial forage, all sheep will be removed from the Mohave Ground Squirrel Conservation Area when ephemeral plants are no longer the primary forage being used by sheep.

The Bureau will use winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), four-winged saltbush (*Atriplex canescens*), shadscale (*A. confertifolia*), and allscale (*A. polycarpa*), which have been identified as important to the foraging ecology of the Mohave ground squirrel, as key species. The maximum utilization levels for sheep grazing in the Mohave Ground Squirrel Conservation Area will be 30 percent for winterfat and 25 percent for the other species; sheep will be removed from the entire or specific portions allotment when these levels are reached.

To facilitate adaptive management, if future research shows that key species different from those in the previous paragraph are important to the Mohave ground squirrel, those species will be added to the monitoring program. Similarly, if a species identified in the previous paragraph is not considered important to the Mohave ground squirrel in another part of its range, that species may be dropped from the list.

Sheep grazing will be prohibited from the Middle Stoddard Mountain Allotment where it coincides with the Mojave Monkeyflower Conservation Area in Brisbane Valley. The Bureau will work with the lessee to clearly identify Mohave monkeyflower habitat to be avoided.

Sheep Grazing within Desert Wildlife Management Areas. These measures will be in effect within 2 years of adoption of the West Mojave Plan. The Gravel Hills and Superior Valley allotments, which are located entirely within desert wildlife management areas, will no longer be available for sheep grazing.

The boundaries of the Buckhorn Canyon, Lava Mountains, Monolith-Cantil, and East and West Stoddard Mountain allotments will be modified so that areas within desert wildlife management areas will no longer be available for sheep grazing. Consistent with the 1994 biological opinion, small portions of the Shadow Mountains and Cantil Common allotments would continue to be grazed (see map 2-14 of Bureau et al. 2005) within desert wildlife management areas. On the Shadow Mountain Allotment, 600 acres of public land that are within the Fremont-Kramer Critical Habitat Unit would be grazed (Chavez 2005a). On the Cantil Common Allotment, approximately 6,196 acres of critical habitat on public lands, also within the Fremont-Kramer Critical Habitat Unit, would be grazed (Chavez 2005b). In both of these cases, the Bureau will use roads to define manageable boundaries of grazed areas, rather than relying on the boundaries contained in the final rule for the designation of critical habitat of the desert tortoise; in many cases, the boundaries of critical habitat were drawn on section lines, which cannot be detected on the ground.

Sheep grazing use would be authorized in the Shadow Mountains and Cantil-Common allotments where they overlap desert wildlife management areas under the following conditions. Turnout of sheep will not occur until 350 pounds per acre of ephemeral forage are available. The lessee will be required to remove sheep from an area of the allotment if ephemeral forage production falls below 350 pounds per acre. The last day of sheep use will be June 1. Watering and loading and unloading will occur at established previously disturbed sites. The conditions summarized in Appendix O of the final environmental impact report and statement (Bureau et al. 2005) would also apply.

Voluntary Relinquishment of Cattle and Sheep Allotments. The California Desert Conservation Area Plan does not currently provide for voluntary relinquishment of cattle and sheep allotments, but it would be amended to allow for this action. Voluntary relinquishment of a grazing permit or lease, combined with a decision in the West Mojave Plan designating selected public lands as not available for livestock grazing, is an important method for achieving conservation goals for desert tortoise and other sensitive species. By itself, voluntary relinquishment has no effect on whether an allotment may be grazed. The Bureau may transfer the forage made available as a result of the relinquishment to a new permittee or lessee if grazing is an allowable use under the existing land use plan. Any qualified applicant can apply for the available forage. When combined with a land use planning decision designating public lands as not available for livestock grazing, voluntary relinquishment can result in long-term reduction or elimination of grazing on public lands. Land use planning decisions are not irreversible, however, and a decision to designate lands as available or not available for livestock grazing can be changed through a subsequent plan amendment or revision.

Upon approval of the West Mojave Plan, allotments identified for voluntary relinquishment would continue to be available for livestock grazing under the terms and conditions of the plan until a permittee or lessee submits a written request for voluntary relinquishment, the Bureau and the permittee or lessee agree on a timeframe, and the Bureau complies with all statutory requirements including issuance of a grazing decision in accordance with 43 *Code of Federal Regulations* 4160.1 based on site-specific environmental review, consultation with affected

parties, and such other procedures as may be required by statute or regulation. A grazing decision can be appealed to the Interior Board of Land Appeals.

The Bureau has been contacted by third parties who have expressed an interest in acquiring the grazing preference and permit/lease in the west Mojave Desert planning area for purposes other than livestock grazing. Private parties may use a variety of financial arrangements and sale contracts to acquire ranches and transfer the associated grazing permit. The Bureau is not a party to these private agreements. Although the Bureau may acknowledge an agreement during the planning process in connection with a voluntary request for relinquishment, the Bureau conducts its own analysis and makes its own independent decision about devoting public rangelands to a use other than livestock grazing.

The Bureau's decision whether to identify an allotment for voluntary relinquishment and subsequent designation of the public lands as not available for grazing is based on criteria set forth in the its Land Use Planning Handbook, H-1790-1, Appendix C. A separate plan amendment or revision will not be required where voluntary relinquishment is identified as a management action for an allotment. In the planning area, the Cady Mountain, Cronese Lake, Harper Lake, Ord Mountain, Pilot Knob, Bissell, Boron, Buckhorn Canyon, Cantil Common, Lava Mountains, Monolith-Cantil, Shadow Mountains, Spangler Hills, East Stoddard Mountain, Middle Stoddard Mountain, West Stoddard Mountain, and Rudnick Common allotments may potentially be relinquished.

Grazing use would continue until the lessee voluntarily relinquishes its grazing preference and lease. Upon relinquishment, the Bureau would, without further analysis or notice: not reissue the lease; remove the allotment designation; assume any and all private interest in range improvements located on public land; and designate the land within the allotment as no longer available for livestock grazing.

Voluntary relinquishment would only occur where the action would ultimately result in direct conservation benefits for special-status plant and animal species covered by the West Mojave Plan. Table 2-20 of the final environmental impact report and statement lists the grazing allotments that may be relinquished and species that would benefit from this action. (Note that the habitat conservation plan in development for the western Mojave Desert includes numerous sensitive species that are not subject to the consultation requirements of section 7(a)(2) of the Act.)

Allotments identified as "Common" (e.g., Rudnick Common) are so-named because multiple lessees have grazing rights on those allotments; several of them are identified for both cattle and sheep grazing. Lessees may request voluntary relinquishment of the portion of common allotments they are permitted to graze where use areas have been identified through an allotment management plan or where management areas or pastures have been assigned by the Bureau in accordance with 43 *Code of Federal Regulations* 4110.2-4. Where common allotments are not divided into use areas, voluntary relinquishment must be requested by all lessees permitted to graze the allotment.

Amendment 9, Public Land Vehicle Access Network. The Bureau, through the West Mojave Plan, will designate routes on public lands that it manages as open, closed to motorized vehicle access, or open on a limited basis. The designation process included an extensive revision of the route network within critical habitat of the desert tortoise, the design of a route network compatible with sensitive resources in specific areas, and retention of existing route networks in specific areas, such as portions of the networks designated in 1985 and 1987, and within existing areas of critical environmental concern, the Rand Mountains - Fremont Valley Management Area, and the Ord Mountain pilot program area.

Because of court-ordered deadlines, the Bureau signed a decision record in June 2003 regarding the adoption of a motorized vehicle access network in the western Mojave Desert; the Service issued a biological opinion on the proposed network on June 30, 2003 (Service 2003a). That decision record amended the California Desert Conservation Area Plan to adopt the network. However, because the motorized vehicle access network is also a component of the West Mojave Plan's conservation strategy, the analysis presented in the environmental assessment for route designation was included in the draft environmental impact report and statement for this amendment of the California Desert Conservation Area Plan. Consequently, the Bureau accepted comments regarding suggested modifications of the network during the public review of the draft environmental impact report and statement. The record of decision for the California Desert Conservation Area Plan amendment regarding the West Mojave Plan will incorporate the route network that was approved in June 2003, as modified during completion of the West Mojave Plan. The final environmental impact report and statement contains a full discussion of the history of route designation and the methods and criteria used to develop the currently proposed network. Adoption of the California Desert Conservation Area Plan amendment for the western Mojave Desert will result in a route network that consists of 5,433.4 miles of open routes and 30.6 miles of limited routes within habitat of the desert tortoise (LaPre 2005e and 2005h, respectively).

The Bureau will retain approximately 20 miles of the competition route network located to the northeast of the Spangler Hills Off-highway Vehicle Management Area. Approximately 10 miles of new open routes adjacent to the southern boundary of the Spangler Hills Off-highway Vehicle Management Area would be provided to provide touring loops and access connections. In total, approximately 15 miles of new open routes would be designated and 20 miles of open routes would be designated as competition routes. To offset the opening of new routes, approximately 35 miles of currently open routes within the Fremont-Kramer Desert Wildlife Management Area will be closed.

In a biological opinion, dated June 30, 2003, we concluded that the proposed designation of routes of travel in the western Mojave Desert was not likely to jeopardize the continued existence of Lane Mountain milk-vetch (Service 2003a). The Bureau proposed closure of an additional 12 routes and designated 2 routes as open on a limited basis within the West Paradise and Coolgardie conservation areas, but did not quantify the length of these routes (see Appendix R and Chapter 6 [response 182-26] of the final environmental impact report and statement). These reductions in the extent of the route network within the area occupied by Lane Mountain milk-vetch should be protective of this species and its habitat by reducing the potential for

unauthorized use of the area. Consequently, we will not include additional discussion of this proposal with regard to the listed plant species and their critical habitat in this biological opinion. We note, however, that unauthorized off-road vehicle use continues to threaten Lane Mountain milk-vetch in the southern portion of Coolgardie Mesa; we will provide additional detail on this issue in the Environmental Baseline - Status of the Lane Mountain Milk-vetch in the Action Area section of this biological opinion.

Measures to Avoid Adverse Effects. Routes designated as open would be available for commercial, recreational, casual access, permitted non-competitive, and other uses. Motorized vehicles will not be allowed to travel off of designated routes, except in emergency situations or with the explicit permission of the Bureau. The current law regarding speed limits on unimproved roads will apply. Basic Speed Law (38305) of the 2001 Vehicle Code, Traffic Laws states: “no person would drive an off-highway motor vehicle at a speed limit greater than is reasonable or prudent and in no event at a speed which endangers the safety of other persons and property.” If monitoring or studies show that certain unimproved roads are causing increased mortality of desert tortoises, the Bureau will consider ways, including speed regulators, to reduce or avoid the level of mortality. On public lands, motorized vehicle travel in washes will be allowed only in those washes that are designated as “open routes” and signed as appropriate.

The final environmental impact statement notes that various groups volunteer to organize and complete projects such as the removal of trash and debris on desert lands, the installation of signs, fencing, barriers, and routine maintenance activities. To eliminate the need for separate documents to comply with the National Environmental Policy Act for each project, the Bureau proposed to conduct these actions under a set of standard programmatic stipulations. We note that desert tortoises and their habitat can benefit from actions such as the removal of trash and debris on desert lands, the installation of signs, fencing, and barriers; however, these actions also pose some threat because desert tortoises may be killed during implementation of these projects. We also note that the Bureau did not include standard programmatic stipulations in the final environmental impact statement. Consequently, although we agree that many of these projects may benefit the desert tortoise and its critical habitat, we will not discuss them further in this biological opinion; additional consultation, pursuant to section 7(a)(2) of the Act, may be required if the Bureau determines that these actions may affect the desert tortoise or its critical habitat.

We have previously concurred with your determination that the proposed route designation in the western Mojave Desert was not likely to adversely affect the Cushenbury milk-vetch and Parish’s daisy or their designated critical habitat because of the relatively limited occurrences of the listed carbonate plants on Bureau lands, the relatively limited number of open routes, and the steep terrain that generally reduces the level of unauthorized off-road use (Service 2003a). The final environmental impact report and statement does not include any changes to the route network within habitat of the carbonate plants. Consequently, we will not discuss these species further with regard to route designation in this biological opinion.

Amendment 10, Stopping and Parking of Motorized Vehicles and Vehicular Camping. Within desert wildlife management areas, camping in association with motorized vehicles would be

allowed in previously existing disturbed camping areas adjacent to motorized vehicle routes designated as open. Stopping and parking of motorized vehicles would be allowed within 50 feet of the centerline of the designated route. Outside of desert wildlife management areas, on public lands administered by the Bureau, stopping, parking and camping associated with motorized vehicles must occur within 300 feet of routes designated as open in accordance with existing regulations. The existing regulations state that "... no person shall operate an off-road vehicle on public lands ... in a manner causing, or likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitat, improvements, cultural, or vegetative resources or other authorized uses of the public lands" (43 *Code of Federal Regulations* 8341.1(f)(4)). Stopping, parking and camping must be done in a manner that would not cause uncontrolled widening of routes and undue degradation of sensitive or fragile resources.

Because stopping and parking motorized vehicles and vehicular camping can only occur along open routes, we analyzed the potential for this activity to affect the Parish's daisy and Cushenbury milk-vetch in our earlier consultation (Service 2003a). As noted in the previous section, we have previously concurred with your determination that the proposed route designation in the western Mojave Desert was not likely to adversely affect the Cushenbury milk-vetch and Parish's daisy or their designated critical habitat. Consequently, we will not discuss these species further with regard to stopping and parking motorized vehicles and vehicular camping in this biological opinion. We will discuss the potential effects of this activity on the Lane Mountain milk-vetch in the Effects of the West Mojave Plan on Lane Mountain Milk-Vetch - Amendment 10, Stopping and Parking of Motorized Vehicles and Vehicular Camping section of this biological opinion.

Amendment 11, Barstow to Vegas Race Course. The record of decision for the Bureau's Northern and Eastern Mojave Management Plan amended the California Desert Conservation Area Plan to eliminate the portion of the Barstow to Vegas course located within that planning area (Bureau 2002b). That action eliminated the eastern three-quarters of the route. Under Alternative B of the West Mojave Plan, the Bureau will amend the California Desert Conservation Area Plan to eliminate the western fragment of the old course. This action will benefit the desert tortoise and its critical habitat by eliminating an event that likely resulted in disturbance of habitat each year it was conducted; at least some desert tortoises have also likely been killed during this event in previous years. Consequently, we will not discuss this proposed action further in this biological opinion.

Amendment 11, Stoddard Valley to Johnson Valley Race Corridor. The Bureau will eliminate the Stoddard Valley to Johnson Valley race corridor. A designated open route would be retained between the two off-highway vehicle management areas. Any special events using this open route will be managed as non-speed events outside of the off-highway vehicle management areas. This action will benefit the desert tortoise and its critical habitat by eliminating an event that likely resulted in disturbance of habitat when events were conducted; the use of this corridor as an open route, subject to the same management prescriptions as other routes, will likely result in the same type of effects that have been discussed elsewhere in this biological opinion. Consequently, we will not discuss this proposed action further in this biological opinion.

Miscellaneous Actions. The Bureau proposed several additional actions as part of the West Mojave Plan that were not included in a specific amendment. We have summarized the actions that may be relevant to the listed species under consideration in this biological opinion in the following sections.

Johnson Valley to Parker Race Corridor. The Johnson Valley to Parker race corridor would be retained. The Johnson Valley to Parker race would continue on designated open routes as a permitted, organized event. Races in this corridor would require a special event permit from the Bureau. Stipulations in the special event permit would address issues such as law enforcement, sanitation, safety and resource protection, and any necessary minor modifications of the route. Where this corridor borders the boundaries of a desert wildlife management area, it will be run under yellow flag conditions.

The Bureau also proposes to designate a route network for the El Paso Mountains and Ridgecrest regions using a collaborative process involving stakeholders. We will not consider this action further in this biological opinion because the planning process has not been completed.

The Bureau proposes to nominate certain segments of the route network for inclusion by the California Department of Parks and Recreation as part of the California Back Country Discovery Trail. Because this trail would be located on existing routes, we envision that it would affect listed species in the same manner as the route network. Consequently, we will not consider this action further in this biological opinion.

Education Programs. The Bureau proposes to work with the general public, special interest groups, schools, government agencies, and development and commercial interests through a variety of media to make them aware of the resource values of the western Mojave Desert. We have generally found that properly implemented educational and outreach programs are vital to most successful conservation efforts. Because we do not anticipate any adverse effects to the desert tortoise from this program, we will not discuss it further in this biological opinion.

Additional Measures Related to Livestock Grazing

By memorandum dated March 17, 2005, the Bureau (2005a) requested that we include, in the biological opinion regarding the effects of the California Desert Conservation Area Plan on the desert tortoise and its critical habitat, a different mechanism of reporting on the conditions of livestock allotments than was contained in the original biological opinion on the California Desert Conservation Area Plan (Service 2002a). The revision reflected current grazing management, including the public land health standards, the regional standards and guidelines, and allotment-specific measures to protect the desert tortoise. Your memorandum also described the procedures to be used in the western Mojave Desert until the planning process for that area is completed; by electronic mail dated May 20, 2005, the Bureau indicated that it will also use this method of reporting for grazing in the western Mojave Desert (LaPre 2005b).

Specifically, the Bureau will authorize grazing activities in allotments within the planning area under the prescribed parameters for grazing use in desert tortoise habitat. If the Bureau finds that

grazing activities within an allotment are no longer in conformance with the plans, the Bureau will investigate and establish a corrective management action. The Bureau will contact the Service within 30 days of determining a management action. A determination will include either short-term or long-term management actions to resolve the conflict. Short-term corrective actions will require notification to the Service. A determination by the Bureau of a conflict that requires a long-term management measure may require informal or formal consultation with the Service. The Bureau will provide periodic reporting until the conflict within desert tortoise habitat is resolved or receipt of an allotment-specific biological opinion.

This method of reporting and resolving instances where grazing may occur in a manner that is not consistent with the parameters that the Bureau proposed achieves the goals intended by the first term and condition of the original biological opinion for the desert tortoise on the California Desert Conservation Area Plan (Service 2002a). Specifically, this method provides a mechanism by which the Bureau will ensure that livestock grazing does not affect desert tortoises in a manner that was not considered in this biological opinion. Consequently, we will not discuss general reporting requirements with regard to livestock grazing again in this biological opinion.

Action Area

The implementing regulations for section 7(a)(2) of the Act describe the action area to be all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 *Code of Federal Regulations* 402.02). The Federal action being considered in this biological opinion is the proposed amendment of the California Desert Conservation Area Plan through the adoption of the West Mojave Plan. Consequently, the action area under consideration in this biological opinion generally consists of public lands managed by the Bureau within the planning area for the West Mojave Plan, as described in the final environmental impact statement and report (Bureau et al. 2005). The planning area is located in the western Mojave Desert of California. In some portions of the planning area, land managed by the Bureau occurs in a checkerboard pattern with land owned by private entities and the State of California. We have generally considered the action area to include non-federal lands that are intermixed with or immediately adjacent to public lands; we have included these lands that are immediately adjacent or intermingled in the action area because the Bureau's management direction can profoundly affect such areas. Examples of this influence occur within grazing allotments, where livestock graze relatively small areas of non-federal land in the same manner as the larger tracts of public land, and along linear rights-of-way, where utility companies implement the same actions and protective measures for listed species on both public and non-federal lands. We considered large blocks of land that are not managed by the Bureau to be outside the action area. Because of their size and location, these large blocks of non-federal land are not affected by the Bureau's management of public lands. For example, we considered the intermingled public and non-federal lands in the area where the Fremont-Kramer and Superior-Cronese critical habitat units for the desert tortoise meet as being within the action area. However, we do not consider the large blocks of non-federal lands to the east of California City or to the west of the Cady Mountains and between Interstates 15 and 40 to be part of the action area.

Because of the scale and complexity of the proposed action and the number of species involved with this consultation, we have elected to present the Status of the Species (and Critical Habitat, where appropriate), Environmental Baseline, Effects of the Action, Cumulative Effects, and Conclusion sections for each species separately.

BIOLOGICAL OPINION FOR THE DESERT TORTOISE AND ITS CRITICAL HABITAT

STATUS OF THE DESERT TORTOISE AND ITS CRITICAL HABITAT

Basic Ecology of the Desert Tortoise

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Desert tortoises may spend more time in washes than in flat areas outside of washes; Jennings (1997) notes that, between March 1 and April 30, desert tortoises “spent a disproportionately longer time within hill and washlet strata” and, from May 1 through May 31, hills, washlets, and washes “continued to be important.” Jennings’ paper does not differentiate between the time desert tortoises spent in hilly areas versus washes and washlets; however, he notes that, although washes and washlets comprised only 10.3 percent of the study area, more than 25 percent of the plant species on which desert tortoises fed were located in these areas. Luckenbach (1982) states that the “banks and berms of washes are preferred places for burrows;” he also recounts an incident in which 15 desert tortoises along 0.12 mile of wash were killed by a flash flood.

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend most of their time in the remainder of the year in burrows, escaping the extreme conditions of the desert; however, recent work has demonstrated that they can be active at any time of the year. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and Service (1994c).

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperatures, and wind (Beatley 1969, 1974, Congdon 1989, Karasov 1989, Polis 1991 in Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet often consists of a few species (Nagy and Medica 1986, Jennings 1993 in Avery 1998). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring; they ate cacti and herbaceous perennials once the winter annuals began to disappear. Medica et al. (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable; Avery (1998) found that desert tortoises rarely ate perennial grasses.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), which, like the desert tortoise, is long lived and matures late, indicate that approximately 70 percent of the young animals must survive each year until they reach adult size; after this time, annual survivorship exceeds 90 percent (Congdon et al. 1993). Research has indicated that 50 to 60 percent of young desert tortoises typically survive from year to year, even in the first and most vulnerable year of life. We do not have sufficient information on the demography of the desert tortoise to determine whether this rate is sufficient to maintain viable populations; however, it does indicate that maintaining favorable habitat conditions for small desert tortoises is crucial for the continued viability of the species.

Desert tortoises typically hatch from late August through early October. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching; when food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter; these burrows are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

Neonate and juvenile desert tortoises require approximately 12 to 16 percent protein content in their diet for proper growth. Desert tortoises, both juveniles and adults, seem to selectively forage for particular species of plants with favorable ratios of water, nitrogen (protein), and potassium. The potassium excretion potential model (Oftedal 2001) predicts that, at favorable ratios, the water and nitrogen allow desert tortoises to excrete high concentrations of potentially toxic potassium, which is abundant in many desert plants. Oftedal (2001) also reports that variation in rainfall and temperatures cause the potassium excretion potential index to change annually and during the course of a plant's growing season. Therefore, the changing nutritive quality of plants, combined with their increase in size, further limits the forage available to small desert tortoises to sustain their survival and growth.

In summary, the ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different than those of subadults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adults. They are active earlier in the season. Finally, small desert tortoises rely on smaller annual plants with greater protein content to be able to gain access to food and to grow, respectively.

Status of the Desert Tortoise

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326). In its final rule, dated April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178).

The desert tortoise was listed in response to loss and degradation of habitat caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the Service's listing of this species.

The following paragraphs provide general information on the results of efforts to determine the status and trends of desert tortoise populations across a large portion of its range; we present information on the status of the desert tortoise within the action area in the Environmental Baseline section of this biological opinion. We have grouped these paragraphs by recovery unit and critical habitat unit; we will describe these units in more detail later in this biological opinion.

Before entering into a discussion of the status and trends of desert tortoise populations across its range, a brief discussion of the methods of estimating the numbers of desert tortoises would be useful. Three primary methods have been widely used: permanent study plots, triangular transects, and line distance sampling.

Generally, permanent study plots are defined areas that are visited at roughly 4-year intervals to determine the numbers of desert tortoises present. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Range-wide, 49 plots have been used at one time or another to attempt to monitor desert tortoises (Tracy et al. 2004).

Triangular transects are used to detect sign (i.e., scat, burrows, footprints, etc.) of desert tortoises. The number of sign is then correlated with standard reference sites, such as permanent study plots, to allow the determination of density estimates.

Finally, line distance sampling involves walking transects while trying to detect live desert tortoises. Based on the distance of the desert tortoise from the centerline of the transect, the length of the transect, and a calculation of what percentage of the animals in the area were likely to have been above ground and visible to surveyors during the time the transect was walked, an estimation of the density can be made. Each of these methods has various strengths and weaknesses; the information we present on the density of desert tortoises across the range and in the action area is based on these methods of collecting data.

Note that, when reviewing the information presented in the following sections, determining the number of desert tortoises over large areas is extremely difficult. The report prepared by the Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) acknowledges as much. Desert tortoises spend much of their lives underground or concealed under shrubs, are not very active in years of low rainfall, and are distributed over a wide area in several different types of habitat. Other factors, such as the inability to sample on private lands and rugged terrain, further complicate sampling efforts. Consequently, the topic of determining the best way to estimate the abundance of desert tortoises has generated many discussions over the years. As a result of this difficulty, we cannot provide concise estimations of the density of desert tortoises in each recovery unit or desert wildlife management area that have been made in a consistent manner.

Given the difficulty in determining the density of desert tortoises over large areas, the reader needs to understand fully that the differences in density estimates in the recovery plan and those derived from subsequent sampling efforts may not accurately reflect on-the-ground conditions. Despite this statement, the reader should also be aware that the absence of live desert tortoises and the presence of carcasses over large areas of some desert wildlife management areas provide at least some evidence that desert tortoise populations seem to be in a downward trend in some regions.

Upper Virgin River Recovery Unit

The Upper Virgin River Recovery Unit is located in the northeastern most portion of the range of the desert tortoise; the Red Cliffs Reserve was established as a conservation area within this

critical habitat unit. The recovery plan states that desert tortoises occur in densities of up to 250 adult animals per square mile within small areas of this recovery unit; overall, the area supports a mosaic of areas supporting high and low densities of desert tortoises (Service 1994c). We have summarized the information in this paragraph from a report by the Utah Division of Wildlife Resources (McLuckie et al. 2003). The Utah Division of Wildlife Resources has intensively monitored desert tortoises, using a distance sampling technique, since 1998. Monitoring in 2003 indicated that the density of desert tortoises was approximately 44 per square mile throughout the reserve. This density represents a 41 percent decline since monitoring began in 1998. The report notes that the majority of desert tortoises that died within one year (n=64) were found in areas with relatively high densities; the remains showed no evidence of predation. Upper respiratory tract disease has been observed in this population; the region also experienced a drought from 1999 through 2002, with 2002 being the driest year. McLuckie et al. (2003) attribute the primary cause of the die-off to drought, but note that disease, habitat degradation, direct mortality of animals, and predation by domestic dogs and common ravens were also factors in the decline.

Northeastern Mojave Recovery Unit

The Northeastern Mojave Recovery Unit is located to the southwest of the Upper Virgin River Recovery Unit and extends through Nevada and into California in Ivanpah Valley. Several critical habitat units and four desert wildlife management areas are located within this recovery unit. Tracy et al. (2004) note that densities of adult desert tortoises for the overall region do not show a statistical trend over time.

The Beaver Dam Slope Desert Wildlife Management Area covers portions of Nevada, Utah, and Arizona; it is located to the southwest of the Red Cliffs Reserve. Based on various methods, the recovery plan estimates the density of desert tortoises in this desert wildlife management area as being from 5 to 56 animals per square mile (Service 1994c). McLuckie et al. (2001) estimated the density in 2001 to be approximately 7.9 reproductive desert tortoises per square mile, using a distance sampling method. However, they also note several problems with the sampling effort, including too few transects and transects placed in habitat types not normally inhabited by desert tortoises; we also note that, as described in the previous paragraph, the survey occurred during a year of lower-than-average rainfall, which would decrease activity levels of desert tortoises and make them more difficult to detect. The encounter rate during this survey was so low that the precision level of the results is low; other monitoring plots, from earlier years, showed higher density estimates.

The Gold Butte-Pakoon Desert Wildlife Management Area covers portions of Nevada and Arizona, generally south of the Beaver Dam Slope Desert Wildlife Management Area. The recovery plan states that densities of desert tortoises in this recovery unit vary from 5 to 56 animals per square mile (Service 1994c).

The Mormon Mesa Desert Wildlife Management Area is located entirely in Nevada, generally west and northwest of the Beaver Dam Slope and Gold Butte-Pakoon desert wildlife management areas, respectively. The recovery plan states that densities of desert tortoises in this recovery unit vary from 41 to 87 subadult and adult animals per square mile (Service 1994c).

The Coyote Springs Desert Wildlife Management Area is located entirely in Nevada, generally west of the Mormon Mesa Desert Wildlife Management Area and east of the Desert National Wildlife Refuge. The recovery plan states that densities of desert tortoises in this recovery unit vary from 0 to 90 adult animals per square mile (Service 1994c). Kernel analysis for the Coyote Springs Desert Wildlife Management Area showed areas where the distributions of carcasses and living desert tortoises do not overlap (Tracy et al. 2004); this scenario is indicative of a higher than average rate of mortality. (The Desert Tortoise Recovery Plan Assessment Committee used a kernel analysis to examine the distribution of live desert tortoises and carcasses over large areas of the range of the species (Tracy et al. 2004). The intent of this analysis is to determine where large areas with numerous carcasses do not overlap large areas with live animals. Regions where the areas of carcasses do not overlap areas of live animals likely represent recent die-offs or declines in desert tortoise populations.) Because permanent study plots for this region were discontinued after 1996, recent declines in numbers would not be reflected in the kernel analysis if they had occurred.

The Ivanpah Desert Wildlife Management Area lies east of the Mojave National Preserve and covers approximately 36,795 acres. It is contiguous with National Park Service lands; note that the National Park Service did not designate desert wildlife management areas within the Mojave National Preserve because it considers that all of its lands are managed in a manner that is conducive to the recovery of the desert tortoise. The permanent study plot in the Ivanpah Valley is located within the Mojave National Preserve and provides information on the status of desert tortoises in this general region. Data on desert tortoises on this permanent study plot were collected in 1980, 1986, 1990, and 1994; the densities of desert tortoises of all sizes per square mile were 386, 393, 249, and 164, respectively (Berry 1996). (Numerous data sets are collected from the study plots and various statistical analyses conducted to provide information on various aspects of trends. We cannot, in this biological opinion, provide all of this information; therefore, we have selected the density of desert tortoises of all sizes per square mile to attempt to indicate trends.) The number of juvenile and immature desert tortoises on the study plot declined, although the number of adult animals remained fairly constant. The notes accompanying this report indicated that the “ill juvenile and dead adult male (desert) tortoises salvaged for necropsy contained contaminants;” it also cited predation by common ravens and the effects of cattle grazing as causative factors in the decline in the number of juvenile and immature desert tortoises on the study plot (Berry 1996). In 2002, workers found 55 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005).

Eastern Mojave Recovery Unit

The Eastern Mojave Recovery Unit extends from west of Clark Mountain, south through the Mojave National Preserve, and east into southern Nevada. Within this recovery unit, the Bureau designated the Shadow Valley and Piute-Fenner desert wildlife management areas within California and the Piute-El Dorado Desert Wildlife Management Area in Nevada.

The Shadow Valley Desert Wildlife Management Area, which occupies approximately 101,355 acres, lies north of Interstate 15 and west of the Clark Mountains. The Mojave National Preserve is located to the south of the interstate. Data on desert tortoises on a permanent study plot in this

area were collected in 1988 and 1992; the densities of desert tortoises of all sizes per square mile were 50 and 58, respectively (Berry 1996). Although these data seem to indicate a slight increase in the number of desert tortoises, in 2002, workers found five desert tortoises on this plot; this number does not represent a density estimate (Berry 2005). Some signs of shell disease have been observed in the population in recent years (Bureau 2002c).

The Bureau's Piute-Fenner Desert Wildlife Management Area lies to the east of the southeast portion of the Mojave National Preserve and is contiguous with National Park Service lands. It occupies approximately 173,850 acres. The Goffs permanent study plot, which is located within the Mojave National Preserve, provides information on the status of desert tortoises in this general region. Data on desert tortoises on this permanent study plot were collected in 1980, 1990, and 1994; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 440, 362, and 447 individuals per square mile, respectively. As Berry (1996) noted, these data seem to indicate that this area supported "one of the more stable, high density populations" of desert tortoises within the United States. Berry (1996) also noted that "a high proportion of the animals (had) shell lesions." In 2000, only 30 live desert tortoises were found; Berry (2000) estimated the density of desert tortoises at approximately 88 animals per square mile. The shell and skeletal remains of approximately 393 desert tortoises were collected; most of these animals died between 1994 and 2000. Most of the desert tortoises exhibited signs of shell lesions; three salvaged desert tortoises showed abnormalities in the liver and other organs and signs of shell lesions. None of the three salvaged desert tortoises tested positive for upper respiratory tract disease.

The Piute-Eldorado Desert Wildlife Management Area is located entirely in southern Nevada and is contiguous with California's Piute-Fenner Desert Wildlife Management Area. Based on various methods, the recovery plan estimates the density of desert tortoises in this desert wildlife management area as being from 40 to 90 adults per square mile (Service 1994c). A kernel analysis of the results of distance sampling data from 2001 depicted large areas where only carcasses were detected (Tracy et al. 2004). Only six live desert tortoises were encountered in approximately 103 miles of transects during this sampling effort; this encounter rate is very low.

Northern Colorado Recovery Unit

The Northern Colorado Recovery Unit extends from Interstate 40 south, almost to Interstate 10 and from the eastern portions of Joshua Tree National Park east to the Colorado River; it is located immediately south of the Eastern Mojave Recovery Unit. The 874,843-acre Chemehuevi Desert Wildlife Management Area, which is managed by the Bureau, is the sole conservation area for the desert tortoise in this recovery unit.

Two permanent study plots are located within this desert wildlife management area. At the Chemehuevi Valley and Wash plot, 257 and 235 desert tortoises were registered in 1988 and 1992, respectively (Berry 1999). During the 1999 spring survey, only 38 live desert tortoises were found. The shell and skeletal remains of at least 327 desert tortoises were collected; most, if not all, of these animals died between 1992 and 1999. The frequency of shell lesions and nutritional deficiencies appeared to be increasing and may be related to the mortalities.

The Upper Ward Valley permanent study plot was surveyed in 1980, 1987, 1991, and 1995; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 437, 199, 273, and 447 individuals per square mile, respectively. In 2002, workers found 17 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005).

Eastern Colorado Recovery Unit

The Eastern Colorado Recovery Unit, which is located immediately south of the Northern Colorado Recovery Unit, extends from just north of Interstate 10 south to the Mexico border near Yuma, Arizona; the Salton Sink and Imperial Valley form the western edge of this recovery unit, which extends east to the Colorado River. The Chuckwalla Desert Wildlife Management Area, which covers 818,685 acres, is the sole conservation area for the desert tortoise in this recovery unit. The Marine Corps (Chocolate Mountains Aerial Gunnery Range), Bureau, and National Park Service (Joshua Tree National Park) manage the Federal lands in this recovery unit and desert wildlife management area. Two permanent study plots are located within this desert wildlife management area.

At the Chuckwalla Bench plot, Berry (1996) calculated approximate densities of 578, 396, 167, 160, and 182 desert tortoises per square mile in 1979, 1982, 1988, 1990, and 1992, respectively. In 1997, workers found 52 desert tortoises on this plot; this number does not represent a density estimate (Berry 2005). At the Chuckwalla Valley plot, Berry (1996) calculated approximate densities of 163, 181, and 73 desert tortoises per square mile in 1980, 1987, and 1991, respectively. Tracy et al. (2004) concluded that these data show a statistically significant decline in the number of adult desert tortoises over time; they further postulate that the decline on the Chuckwalla Bench plot seemed to be responsible for the overall significant decline within the recovery unit.

Western Mojave Recovery Unit

Although desert tortoises were historically widespread in the western Mojave Desert, their distribution within this region was not uniform. For example, desert tortoises likely occurred at low densities in the juniper woodlands of the western Antelope Valley and in the sandier habitats in the Mojave River valley. They were also likely largely absent from the higher elevations of the Ord and Newberry mountains and from playas and the areas immediately surrounding these dry lakes. Several large areas of land that are not managed by the Bureau lie within the Western Mojave Recovery Unit; because of their size, these areas are not affected by the Bureau's management of public lands and are therefore not part of the action area for this consultation. These areas lie primarily on military bases, within Joshua Tree National Park, and in areas of private land.

Desert tortoises occur over large areas of Fort Irwin, which is managed by the Department of the Army (Army). At Fort Irwin, the Army conducts realistic, large-scale exercises with large numbers of wheeled and tracked vehicles. In areas where training has occurred for many decades, desert tortoises persist in relatively low numbers primarily on the steep, rugged slopes of the mountain ranges that occur throughout Fort Irwin. Through Public Law 107-107,

approximately 118,600 acres were added to Fort Irwin along its southwestern and eastern boundaries in 2002. Approximately 97,860 acres of the Superior-Cronese Critical Habitat Unit lie along the original southern boundary of Fort Irwin and in the parcel to the southwest that was added in 2002 (Charis Professional Services Corporation 2003, Army 2004). Currently, the Army may conduct some low intensity training in these areas on occasion and some preparations for the onset of force-on-force training should begin soon. To date, these parcels have not been used for force-on-force training; within the next few years, the Army will begin to use a large portion of these lands for maneuvers with numerous wheeled and tracked vehicles. In our biological opinion regarding the effects of the use of these lands for training on the desert tortoise (Service 2004a), we noted that approximately 1,299 to 1,349 adult desert tortoises may occur within the action area for that consultation. The Army established several conservation areas, totaling approximately 16,900 acres, just inside the boundaries of Fort Irwin where maneuvers would not occur. The Army calculated that approximately 152 desert tortoises may reside within these areas; these animals are unlikely to be affected by use of the new training lands. Additionally, because of other restrictions that the Army will follow during training, approximately 5,500 acres of critical habitat of the desert tortoise within the additional training lands will not be used for force-on-force training. These lands lie primarily on and around dry lakes, which generally do not support large numbers of desert tortoises, because the lake beds themselves do not provide suitable habitat and the areas immediately surrounding the playas usually support substrates composed of clays and silt that are not suitable for burrowing. Finally, in the Eastgate portion of Fort Irwin, approximately 288 desert tortoises may be exposed to additional training; however, most of these animals are located in an area that is unlikely to receive much use by vehicles and are thus unlikely to be affected. The Army and Service have agreed that desert tortoises within new training areas that are likely to be killed by maneuvers will be translocated to newly acquired lands to the south of Fort Irwin; a plan for this translocation is currently under development.

The Navy has designated approximately 200,000 acres of the South Range at the Naval Air Weapons Station, China Lake as a management area for the desert tortoise (Service 1995). Through a consultation with the Service (1992a), the Navy agreed to try to direct most ground-disturbing activities outside of this area, to use previously disturbed areas for these activities when possible, and to implement measures to reduce the effects of any action on desert tortoises. This area also encompasses the Superior Valley Tactical Bombing Range located in the southernmost portion of the Mojave B South land management unit of the Naval Air Weapons Station; it continues to be used as an active bombing range for military test and training operations by the Navy and Department of Defense. In the 3 years for which we had annual reports available, activities conducted by the Navy did not kill or injure any desert tortoises (Navy 1995, 2001, 2002). In general, desert tortoises occur in low densities on the North Range of the Naval Air Weapons Station; Kiva Biological Consulting and McClenahan and Hopkins Associates (in Service 1992a) reported that approximately 136 square miles of the North Range supported densities of 20 or fewer desert tortoises per square mile. The South Range supported densities of 20 or fewer desert tortoises per square mile over an area of approximately 189 square miles and densities of greater than 20 per square mile on approximately 30 square miles. The higher elevations and latitude in this area may be responsible for these generally low densities (Weinstein 1989 in Bureau et al. 2005).

The Indian Wells Valley, which is located to the southwest of the Naval Air Weapons Station, likely supported desert tortoises at higher densities in the past. Urban, suburban, and agricultural development in this area is likely cause of the lower densities that are currently found in this area.

Edwards Air Force Base is used primarily to test aircraft and weapons systems used by the Department of Defense. Desert tortoises occur over approximately 220,800 acres of the installation. Approximately 80,640 acres of the base have been developed for military uses or are naturally unsuitable for use by desert tortoises, such as Rogers and Rosamond dry lakes. Based on surveys conducted between 1991 and 1994, approximately 160,640 acres of the base supported 20 or fewer desert tortoises per square mile. Approximately 55,040 acres supported densities between 21 and 50 desert tortoises per square mile; from 51 to 69 desert tortoises per square mile occurred on several smaller areas that totaled 5,120 acres (U.S. Air Force 2004). We expect that current densities are somewhat lower, given the regional declines in desert tortoise numbers elsewhere in the Western Mojave Recovery Unit.

Desert tortoises may have been more common in the past the area west of Highway 14 between the town of Mojave and Walker Pass; high levels of off-road vehicle use and extensive livestock grazing are potential causes for the current scarcity of desert tortoises in this area. Four townships of private land east of the city of California City and south of the Rand Mountains supported large numbers of desert tortoises as late as the 1970s; high levels of off-road vehicle use, extensive grazing of sheep, scattered development, and possibly poaching have greatly reduced the density of desert tortoises in this area.

The direct and indirect effects of urban and suburban development extending from Lancaster in the west to Lucerne Valley in the east has largely eliminated desert tortoises from this area. A few desert tortoises remain on the northern slopes of the San Bernardino Mountains, south of Lucerne Valley; however, they seem to be largely absent from the portion of this area in Los Angeles County (Bureau et al. 2005).

The northern portion of Joshua Tree National Park is within the planning area for the West Mojave Plan. Given the general patterns of visitor use at Joshua Tree National Park, we expect that this area receives little use.

Private lands between the northern boundary of Joshua Tree National Park and the southern boundary of the Marine Corps Air Ground Combat Center continue to support desert tortoises; the primary threat to desert tortoises in this area is urbanization.

Desert tortoises occur within the Marine Corps Air Ground Combat Center in densities of greater than 50 per square mile in limited areas; most of the installation, however, supports from 0 to 5 animals per square mile (Jones and Stokes Associates 1998 in Natural Resources and Environmental Affairs Division 2001). The Marine Corps' integrated natural resource

management plan also notes that the number of desert tortoises may have declined in the more heavily disturbed areas of the Marine Corps Air Ground Combat Center and that vehicles, common ravens, and dogs are responsible for mortalities. In general, the Marine Corps Air Ground Combat Center supports a wide variety of training exercises that include the use of tracked and wheeled vehicles and live fire.

Recovery Plan for the Desert Tortoise

The recovery plan for the desert tortoise is the basis and key strategy for recovery and delisting of the desert tortoise. The recovery plan divides the range of the desert tortoise into 6 distinct population segments or recovery units and recommends the establishment of 14 desert wildlife management areas throughout the recovery units. Within each desert wildlife management area, the recovery plan recommends implementation of reserve level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The recovery plan also recommends that desert wildlife management areas be designed to follow the accepted concepts of reserve design and be managed to restrict human activities that negatively affect desert tortoises (Service 1994c). The delisting criteria established by the recovery plan are:

1. The population within a recovery unit must exhibit a statistically significant upward trend or remain stationary for at least 25 years;
2. Enough habitat must be protected within a recovery unit or the habitat and desert tortoises must be managed intensively enough to ensure long-term viability;
3. Populations of desert tortoises within each recovery unit must be managed so discrete population growth rates (λ s) are maintained at or above 1.0;
4. Regulatory mechanisms or land management commitments that provide for long-term protection of desert tortoises and their habitat must be implemented; and
5. The population of the recovery unit is unlikely to need protection under the Endangered Species Act in the foreseeable future.

The recovery plan based its descriptions of the six recovery units on differences in genetics, morphology, behavior, ecology, and habitat use over the range of the Mojave population of the desert tortoise. The recovery plan contains generalized descriptions of the variations in habitat parameters of the recovery units and the behavior and ecology of the desert tortoises that reside in these areas (pages 20 to 22 in Service 1994c). The recovery plan (pages 24 to 26 from Service 1994c) describes the characteristics of desert tortoises and variances in their habitat, foods, burrow sites, and phenotype across the range of the listed taxon. Consequently, to capture the full range of phenotypes, use of habitat, and range of behavior of the desert tortoise as a species, conservation of the species across its entire range is essential.

Assessment of the Recovery Plan

In 2003, the Service appointed a group of researchers to conduct a scientific assessment of the recovery plan for the desert tortoise, which was completed in 1994. This group, called the Desert Tortoise Recovery Plan Assessment Committee, completed its assessment in 2004. The group found that the recovery plan was “fundamentally sound, but some modifications for contemporary management will likely make recovery more successful” (Tracy et al. 2004). The group also found that analyses showed desert tortoise populations were declining in some portions of the range, assessing the density of desert tortoises is difficult, and “the original paradigm of desert tortoises being recovered in large populations relieved of intense threats may be flawed...” (Tracy et al. 2004). Finally, the group reviewed the distinct population segments (or recovery units) described in the recovery plan and concluded they should be modified; briefly, the Desert Tortoise Recovery Plan Assessment Committee recommends leaving the Western Mojave and Upper Virgin River units intact and recombining the remaining four into three distinct population segments.

Status of Critical Habitat

The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994 (59 *Federal Register* 5820). Critical habitat is designated by the Service to identify the key biological and physical needs of the species and key areas for recovery and focuses conservation actions on those areas. Critical habitat is composed of specific geographic areas that contain the biological and physical attributes that are essential to the species’ conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. These features are called the primary constituent elements of critical habitat. The specific primary constituent elements of desert tortoise critical habitat are: sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

The final rule for designation of critical habitat did not explicitly ascribe specific conservation roles or functions to the various critical habitat units. Rather, it refers to the strategy of establishing recovery units and desert wildlife management areas recommended by the recovery plan for the desert tortoise, which had been published as a draft at the time of the designation of critical habitat, to capture the “biotic and abiotic variability found in desert tortoise habitat” (59 *Federal Register* 5820, see page 5823). Specifically, we designated the critical habitat units to follow the direction provided by the draft recovery plan for the establishment of desert wildlife management areas. Note that each critical habitat unit functions independently of the others in terms of providing the physical and biological needs of individual desert tortoises; that is, desert tortoises are not required to move between or among units to complete their life histories. For this reason, we have not presented specific information related to the status of individual critical habitat units that are located outside of the action area. We also note that the critical habitat units

in aggregate are intended to protect the variability that occurs across the large range of the desert tortoise; the loss of any specific unit would eliminate elements of the species' behavioral, ecological, and genetic variability.

We did not designate the Desert Tortoise Natural Area and Joshua Tree National Park in California and the Desert National Wildlife Refuge in Nevada as critical habitat because they are "primarily managed as natural ecosystems" (59 *Federal Register* 5820, see page 5825) and provide adequate protection to desert tortoises. Since the designation of critical habitat, Congress increased the size of Joshua Tree National Park; a portion of the expanded boundary of Joshua Tree National Park lies within critical habitat of the desert tortoise.

Note that, for all critical habitat units, the primary constituent elements are generally functioning, to the best of our knowledge, in a manner that would support the key biological and physical needs of the desert tortoise. In some specific areas within the boundaries of critical habitat, such as within and adjacent to dry lakes, some of the primary constituent elements are naturally absent; desert tortoises do not usually reside in such areas in large numbers. In other areas, human activities have decreased the ability of some of the primary constituent elements to function to the maximum extent; such areas include but are not limited to unpaved roads and areas around water sources within cattle allotments. These areas are too numerous to mention specifically; generally, however, these areas comprise a relatively small portion of the critical habitat unit and do not compromise the conservation role of the units as a whole. Non-native annual plant species are an exception to the general statements in the previous sentences. These species are widely distributed throughout critical habitat units and, in some cases such as Sahara mustard (*Brassica tournefortii*), continuing to spread rapidly; their abundance in any given area varies annually according to weather patterns. Although we do not understand their complete role in relation to the ecology of the desert tortoise, we know that these species can exclude the native annual species on which the desert tortoise depends and can lead to the spread of wildfires. The role of these species with regard to the proper functioning of critical habitat units is an important topic for further research.

The following sections provide a brief description of the portions of the critical habitat units that are within the Western Mojave Recovery Unit but outside of the action area of this consultation. We present similar information for the critical habitat units within the action area in the Environmental Baseline section of this biological opinion.

Superior-Cronese Critical Habitat Unit. Approximately 97,860 acres of the Superior-Cronese Critical Habitat Unit lie within the boundaries of the Army's National Training Center (Charis Professional Services Corporation 2003, Army 2004). Currently, the Army may conduct some low intensity training in these areas on occasion and some preparations for the onset of force-on-force training should begin soon. To date, these parcels have not been used for force-on-force training; within the next few years, the Army will begin to use a large portion of these lands for maneuvers with numerous wheeled and tracked vehicles. In our biological opinion regarding the effects of the use of these lands for training on the desert tortoise (Service 2004a), we noted that approximately 75,439 acres of critical habitat located within Fort Irwin would be affected by force-on-force training. As part of the consultation regarding the effects of the use of these lands

for training on the desert tortoise and its critical habitat (Service 2004a), the Army established several conservation areas, totaling approximately 16,900 acres, just inside the boundaries of Fort Irwin where maneuvers would not occur. Because of other restrictions that the Army will follow during training, approximately 5,500 acres of critical habitat of the desert tortoise within the additional training lands will not be used for force-on-force training. These lands lie primarily on and around dry lakes, which generally do not support high quality habitat of the desert tortoise, because the primary constituent elements are absent from the lake beds themselves and usually of lower quality in the immediately surrounding areas.

Approximately 87,265 acres in the southern portion of the Naval Air Weapons Station at China Lake are designated as critical habitat for the desert tortoise. This area encompasses the Superior Valley Tactical Bombing Range located in the southernmost portion of the Mojave B South land management unit of the Naval Air Weapons Station. This area continues to be used as an active bombing range for military test and training operations by the Navy and other branches of the Department of Defense. Within the area designated as critical habitat, approximately 675 acres are disturbed to date. Disturbed areas support the required road network, associated facilities and infrastructure, and target impact areas (O’Gara 2005).

Fremont-Kramer Critical Habitat Unit. Approximately 65,560 acres of Edwards Air Force Base are designated as critical habitat of the desert tortoise. Disturbance within the portion of the Fremont-Kramer Critical Habitat Unit that occurs within Edwards Air Force Base includes targets, buildings, parking lots, roads, road shoulders, trails, and cleared areas. Approximately 1,670 acres within critical habitat have been disturbed by human activities, including approximately 323 acres of primary and secondary roads. Additionally, approximately 195.3 miles of abandoned jeep trails and other minor routes are located within critical habitat (Collis pers. comm. 2005).

Pinto Mountain Critical Habitat Unit. Approximately 55,596 acres of this critical habitat unit lie within Joshua Tree National Park (Service 2005a). Given the general patterns of visitor use at Joshua Tree National Park, we expect that this area receives little use.

Relationship of Recovery Units, Distinct Population Segments, Desert Wildlife Management Areas, and Critical Habitat Units

The recovery plan (Service 1994c) recognized six recovery units or evolutionarily significant units across the range of the listed taxon, based on differences in genetics, morphology, behavior, ecology, and habitat use of the desert tortoises found in these areas. The boundaries between these areas are vaguely defined. In some cases, such as where the Western Mojave Recovery Unit borders the Eastern Mojave Recovery Unit, a long, low-lying, arid valley provides a fairly substantial separation of recovery units. In other areas, such as where the Eastern Mojave Recovery Unit borders the Northern Colorado Recovery Unit, little natural separation exists. Because of the vague boundaries, the acreage of these areas has not been quantified. Over the years, workers have commonly referred to the areas as “recovery units;” the term “distinct population segment” has not been in common use. As mentioned previously in the Assessment of the Recovery Plan section of this biological opinion, the Desert Tortoise Recovery Plan

Assessment Committee suggests that five recovery units (or distinct population segments) would more appropriately represent variation across the range of the desert tortoise rather than the six described in the recovery plan; because this concept is not yet universally accepted, we will continue to refer to the recovery units described in the recovery plan in this biological opinion.

The recovery plan recommended that land management agencies establish one or more desert wildlife management areas within each recovery unit. As mentioned previously in the Recovery Plan for the Desert Tortoise section of this biological opinion, the recovery plan recommended that these areas receive reserve-level management to remove or mitigate the effects of the human activities responsible for declines in the number of desert tortoises. As was the case for the recovery units, the recovery plan did not determine precise boundaries for the desert wildlife management areas; the recovery team intended for land management agencies to establish these boundaries, based on the site-specific needs of the desert tortoise. At this time, desert wildlife management areas have been established throughout the range of the desert tortoise, except in the Western Mojave Recovery Unit.

Based on the recommendations contained in the draft recovery plan for the desert tortoise (59 *Federal Register* 5820), the Service designated critical habitat units throughout the range of the desert tortoise. The 14 critical habitat units have defined boundaries and cover specific areas throughout the 6 recovery units.

The Bureau used the boundaries of the critical habitat units and other considerations, such as conflicts in management objectives and more current information, to propose and designate desert wildlife management areas through its land use planning processes. In California, the Bureau also classified these desert wildlife management areas as areas of critical environmental concern, which, as we mentioned in the Description of the Proposed Action section of this biological opinion, allows the Bureau to establish management goals for specific resources in defined areas. Through the land use planning process, the Bureau established firm boundaries for the desert wildlife management areas.

Finally, we note that the Department of Defense installations and National Park Service units in the California desert did not establish desert wildlife management areas on their lands. Where the military mission is compatible with management of desert tortoises and their habitat, the Department of Defense has worked with the Service to conserve desert tortoises and their habitat. Examples of such overlap include the bombing ranges on the Navy's Mojave B and the Chocolate Mountains Aerial Gunnery Ranges; although the target areas are heavily disturbed, most of the surrounding land remains undisturbed. Additionally, the Army has established several areas along the boundaries of Fort Irwin where training with vehicles is prohibited; desert tortoises persist in these areas, which are contiguous with lands off-base. We discussed the situation at Joshua Tree National Park in the Status of Critical Habitat section of this biological opinion. The National Park Service did not establish desert wildlife management areas within the Mojave National Preserve, because the entire preserve is managed at a level that is generally consistent with the spirit and intent of the recovery plan for the desert tortoise.

The following table depicts the relationship among recovery units, desert wildlife management areas, and critical habitat units through the range of the desert tortoise.

Critical Habitat Unit	Desert Wildlife Management Area	Recovery Unit	State	Size of Critical Habitat Unit (acres)
Chemehuevi	Chemehuevi	Northern Colorado	CA	937,400
Chuckwalla	Chuckwalla	Eastern Colorado	CA	1,020,600
Fremont-Kramer	Fremont-Kramer	Western Mojave	CA	518,000
Ivanpah Valley	Ivanpah Valley	Eastern Mojave	CA	632,400
Pinto Mountain	Joshua Tree	Western Mojave/Eastern Colorado	CA	171,700
Ord-Rodman	Ord-Rodman	Western Mojave	CA	253,200
Piute-Eldorado- CA	Fenner	Eastern Mojave	CA	453,800
Piute-Eldorado- NV	Piute-Eldorado	Northeastern Mojave/Eastern Mojave	NV	516,800
Superior-Cronese	Superior-Cronese Lakes	Western Mojave	CA	766,900
Beaver Dam: NV UT AZ	Beaver Dam Beaver Dam Beaver Dam	Northeastern Mojave (all)	NV UT AZ	87,400 74,500 42,700
Gold Butte-Pakoon NV AZ	Gold Butte-Pakoon Gold Butte-Pakoon	Northeastern Mojave (all)	NV AZ	192,300 296,000
Mormon Mesa	Mormon Mesa Coyote Spring	Northeastern Mojave	NV	427,900
Upper Virgin River	Upper Virgin River	Upper Virgin River	UT	54,600

Recent Fires

Since December 2004, numerous wildfires have occurred in desert tortoise habitat across its range. In Nevada, the Bureau estimates that 300,000 acres of desert tortoise habitat burned; this figure includes 15,000 to 20,000 acres of critical habitat. Although the greatest extent of burned habitat has occurred in Nevada, desert tortoise habitat also burned in Utah, Arizona, and California. Post-wildfire analyses are underway to quantify the number of acres of both critical and non-critical habitat affected by these wildfires. Although we know that some desert tortoises were killed by the wildfires, mortality estimates are not available at this time (Burroughs 2005).

ENVIRONMENTAL BASELINE FOR THE DESERT TORTOISE AND ITS CRITICAL HABITAT

Previous Consultations

The Bureau and Service have completed numerous formal consultations for actions affecting the desert tortoise or its critical habitat within the boundary of the California Desert Conservation Area. This number does not accurately reflect the number of actions that the Bureau has authorized or implemented for several reasons. First, several formal consultations were programmatic in nature and considered the effects of numerous separate actions; several biological opinions that evaluated the effects of pipeline maintenance are examples of this type of consultation. Other consultations were conducted as a result of the designation of critical habitat for the desert tortoise; these biological opinions evaluated the effects on critical habitat of actions for which consultation on the desert tortoise had already been completed. Finally, we have completed consultation on several actions that were never implemented; the waste disposal sites in the Cady Mountains and at Broadwell Dry Lake are examples of such actions. In addition to these formal consultations, the Bureau and Service have engaged in numerous informal consultations.

The Service has issued several biological opinions to the Bureau with regard to the effects of cattle on the desert tortoise in the northern and eastern Mojave Desert and northern and eastern Colorado Desert planning areas. In August 1992, we issued a biological opinion regarding cattle grazing within desert tortoise habitat along the eastern slopes of the Sierra Nevada (1-6-92-F-55, Service 1992b). In March 1994, we issued a biological opinion regarding 25 grazing allotments within the California Desert Conservation Area (1-8-94-F-17, Service 1994b). That biological opinion concluded that the Bureau's cattle grazing program in the California Desert Conservation Area was not likely to jeopardize the continued existence of the desert tortoise. On April 20, 1994, the Service issued a biological opinion that evaluated the effects of cattle grazing on critical habitat of the desert tortoise, which had recently been designated; the Service concluded that the Bureau's rangewide cattle grazing program was not likely to adversely modify critical habitat of the desert tortoise (1-5-94-F-107, Service 1994a). Several of the allotments that were included in these biological opinions are located within the Western Mojave Recovery Unit. Attachment 1 depicts the current status of grazing allotments within the planning area. Note that several allotments no longer are grazed as a result of various actions that have occurred since the publication of the California Desert Conservation Area Plan in 1980.

The Service and Bureau consulted on the development of several large mines in the early 1990s. Hundreds of acres of habitat were lost as the result of these projects. Several of these mines were in the eastern end of the Rand Mountains where desert tortoises seem to be less common; we do not know whether desert tortoises are less common in this area because the habitat is more rugged and at slightly higher elevation (and therefore not as suitable) or as a result of historical mining activities in the region.

The Service and Bureau have also consulted programmatically on the effects of small mines, small projects, remediation of illegal dumps, installation of minor electrical utilities, and pipeline

maintenance on the desert tortoise and its critical habitat within the Western Mojave Recovery Unit. These consultations were conducted to expedite the consultation process for numerous projects that were similar in nature and had relatively minor effects on the desert tortoise; because of compensation requirements imposed by the Bureau, some acquisition of lands important to the recovery of the species has also occurred as a result of these programs. In the biological opinions for all of these consultations, the Service concluded that the proposed actions were not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat because of the protective measures proposed by the Bureau, the likelihood that these actions could be undertaken with little or no injury to or mortality of desert tortoises, and the small area of disturbance in relation to the available habitat of the species. Under the auspices of one such consultation on mining activities, the Bureau authorized 25 projects between 1998 and 2002. In total, these projects resulted in 41.28 acres of habitat loss or disturbance; no desert tortoises were known to have been killed and one was moved from harm's way. Between 1992 and 1997, the Bureau authorized projects that resulted in approximately 41 acres of disturbance; we were not able to determine the number of individual actions or number of desert tortoises encountered during this period. The Service and Bureau also consulted on a similar process under which various types of activities could be implemented; the same basic criteria were used to screen projects for this consultation. Between 1997 and 2002, the Bureau authorized 35 projects under the auspices of this consultation; these projects resulted in approximately 22 acres of habitat loss or disturbance; monitors were not aware of any desert tortoises being killed and none were handled during implementation of these projects. These biological opinions remain in effect throughout the California Desert Conservation Area.

We have consulted with the Bureau regarding off-highway vehicle management areas in the western Mojave Desert; the Johnson Valley, Stoddard Valley, El Mirage, and Spangler Hills areas had either been established or were in the process of being established when the desert tortoise was listed. Johnson and Stoddard valleys and portions of the El Mirage area likely supported high quality habitat and higher densities of desert tortoises prior to their use for off-road recreation; densities of desert tortoises in the Spangler Hills may not have been as great because of its more northerly location.

We also consulted with the Bureau on programs for dual sport events. We are unaware of any desert tortoises being killed during the hundreds of these events that have occurred since its listing; however, we recognize that desert tortoises may have been killed but not detected. These events are conducted within critical habitat only during periods when desert tortoises are less active; additionally, vehicles are restricted to authorized routes during these events. These factors likely contribute to the lack of mortalities of desert tortoises.

As noted in the Consultation History section of this biological opinion, the Service and Bureau consulted on a network of designated routes in the western Mojave Desert (Service 2003a). As a result of the amendment that was addressed in that consultation, the amount of existing open routes in subregions that overlap critical habitat of the desert tortoise in the western Mojave Desert was reduced from approximately 4,062 to 2,475 miles (Coyote, El Mirage, Fremont, Kramer, Newberry-Rodman, Ord, and Superior subregions, plus the Black Mountain, Rainbow Basin, and Western Rand Mountains areas of critical environmental concern). The Bureau

(2003a) noted that, for several subregions, a proportionately higher number of route closures were in areas characterized by bajada topography. Conversely, a proportionately higher number of routes were designated as open in more mountainous terrain. We and the Bureau expect that roads in more mountainous terrain are less likely to affect desert tortoises because they are generally less common in this type of habitat; also, vehicles are less likely to leave established routes in steep, rugged terrain. The Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) notes that the western Mojave Desert contains a higher density of roads than any other recovery unit. This density comparison is based on the route inventory conducted in 2001 and not the route designation implemented in 2003.

The Service (1990) and Bureau completed formal consultation on a land tenure adjustment program which the Bureau, Air Force, and County of San Bernardino have been implementing since before the desert tortoise was listed. Under the provisions of the Western Mojave Land Tenure Adjustment Program, which is funded by the Air Force, the Bureau exchanges isolated parcels of public land in areas that are more appropriate for development for private lands that are more remote. This program has resulted in the direct acquisition by the Bureau of approximately 9,174 acres of land and of approximately 52,073 acres through exchanges; the Bureau has provided approximately 18,359 acres of land to non-federal entities in exchange (Gonzales 2004). The West Mojave Land Tenure Adjustment Program was amended in 1998 to include some lands near Barstow within the boundaries of the program. This action was part of a complex land exchange with the Catellus Corporation. The Bureau re-initiated consultation on the West Mojave Land Tenure Adjustment Program at that time and we issued a biological opinion on the amended program (Service 1998).

The Service has also issued several biological opinions to other Federal agencies that have affected the desert tortoise and its critical habitat. Several of these biological opinions are notable in their scope and public visibility. The Service issued two biological opinions to the Federal Energy Regulatory Commission regarding the effects of the installation of three large pipelines across the desert. During the first installation, in the early 1990s, approximately 30 desert tortoises were killed; only one desert tortoise was killed in the most recent installation, which occurred in 2003. Portions of these pipelines cross the Western Mojave Recovery Unit.

In 2004, the Service issued a biological opinion to the Army for the use of additional training lands at its National Training Center. The biological opinion considered the loss or degradation of approximately 75,000 acres of desert tortoise habitat within the Superior-Cronese Critical Habitat Unit, the loss or degradation of additional areas of lower quality habitat outside of critical habitat, the translocation of several hundred desert tortoises from areas that will be regularly used for training to locations off-base, and the possible loss of desert tortoises that are not found during the translocation effort. As part of the conservation measures included in the proposed action, Congress will appropriate \$75 million over several years to implement numerous conservation measures (Service 2004a). To date, the Army has purchased approximately 99,000 acres of lands from the Catellus Corporation and the private interests in 3 cattle allotments in the western Mojave Desert as part of the conservation measures for the expanded training areas. We are currently participating in an inter-agency working group to develop a translocation plan for desert tortoises affected by the Army's use of additional training

lands. We mention this consultation because, although the area within the boundaries of Fort Irwin is not within the action area for this consultation, the conservation measures being implemented by the Army as part of the proposed action are likely to have substantial beneficial effects on the desert tortoise and its critical habitat within the action area.

The Department of Defense consulted on a competitive race for robotic vehicles (Service 2004c). Despite the high visibility of this event, most vehicles failed within a short distance of the starting line. Impacts to desert tortoise habitat were insignificant, if any occurred at all; no desert tortoises were killed or injured.

The Federal Highways Administration has funded the widening of many miles of Interstate and State highways in the California Desert Conservation Area. Although hundreds of acres of habitat were destroyed by these actions, the vast majority of the loss was immediately adjacent to the freeways, where desert tortoises are usually scarce and the habitat of poor quality. To mitigate the loss of habitat, the California Department of Transportation has, through its consultations with the California Department of Fish and Game under the authorities of the California Endangered Species Act, fenced dozens of miles of highway to prevent desert tortoises from being killed and acquired thousands of acres of private lands that are being managed for the benefit of the desert tortoise. Boarman and Sazaki (1996) determined that desert tortoises suffer significantly less mortality along fenced roads than along those that are not fenced. In balance, desert tortoises have likely benefited from the actions of the Federal Highways Administration and the California Department of Transportation.

The Service has also consulted many times with the Federal Communications Commission on the installation of cell towers in the California Desert Conservation Area. Although several towers have been installed, the aggregated effects are minor in that desert tortoises are usually avoided during construction and little habitat is affected.

The Bureau notes that, between 1990 and 1995, 101 projects were authorized by 13 Federal agencies throughout the California desert; these actions resulted in the handling, to move desert tortoises from harm's way, 922 desert tortoises and in the deaths of 54 individuals (Appendix L, Bureau et al. 2005). Although we do not have specific data on these projects, most likely occurred in the Western Mojave Recovery Unit, simply because this area is subject to a far greater amount of human activity than the eastern portion of the California Desert Conservation Area. Thirty-eight of the 54 desert tortoises were killed during the installation of the Kern and Mojave pipelines; 3 were killed during construction of the Mead-McCullough-Victorville transmission line. Both of these projects crossed more than one recovery unit; therefore, the 41 desert tortoises that died during these projects were likely distributed across several recovery units. Note also that 733 desert tortoises were handled during implementation of the Kern and Mojave pipelines and Mead-McCullough-Victorville transmission line.

For the period after 1994, LaRue perused files and interviewed staff in the Bureau's Ridgecrest and Barstow field offices to gather information. LaRue (informal notes 2004) found information on eleven consultations for actions located, at least in part, in the western Mojave Desert. Additionally, several pipeline companies implemented maintenance actions under the auspices of

“programmatic” consultations; little disturbance of habitat generally occurs with these projects and, to date, we are unaware of any desert tortoises being killed during these maintenance activities. One of the larger projects, in terms of the amount of habitat disturbance, was the new Kern River Pipeline; it followed the route of the Boulder Utility Corridor through the western Mojave Desert. No desert tortoises were killed or injured during the installation of this pipeline. Portions of the Level 3 fiber optic cable were also installed along this corridor; no mortalities of desert tortoises were reported, 53 animals were moved from harm’s way, and 59 acres of habitat were disturbed. Note that this fiber optic cable also crossed several recovery units. Finally, nine desert tortoises were relocated during construction of a gas line between Kramer Junction and Adelanto; approximately 323 acres of habitat were disturbed.

We find it notable that, with the exception of the original Kern River Pipeline and the Mojave Pipeline, no single project has resulted in the deaths of more than three desert tortoises; during most actions, no desert tortoises have been killed. We attribute the low level of mortality to the protective measures implemented during the consultation process, the fact that many projects are implemented in the winter when desert tortoises are mostly inactive, and, at least in part, to the decline in the number of desert tortoises over large parts of the Mojave Desert over the past several years.

For most projects, the Bureau, under the authorities of the Federal Land and Management Policy Act, requires project proponents to compensate for the unavoidable impacts of projects. Generally, proponents acquire lands that are important for the conservation of the desert tortoise and donate the lands to the Bureau; alternatively, proponents contribute funds to a special account that the Bureau manages for the acquisition of land. Between 1990 and 2002, the Bureau acquired approximately 6,426 acres of compensation lands as a result of projects that were implemented on public lands. For many projects, the California Department of Fish and Game also receives compensation lands from impacts that occur on non-federal lands that are adjacent to public lands.

Status of the Desert Tortoise in the Action Area

Desert tortoises occur over large areas of public lands within the Western Mojave Recovery Unit; however, as we have noted previously in this biological opinion, their distribution is uneven. On public lands, they occur as far north as Olancho and the northern Panamint Valley south to the boundary of Joshua Tree National Park; desert tortoises also occur from the lower foothills of the southern Sierra Nevada and Tehachapi Mountains in the west east to Death Valley and the eastern side of Joshua Tree National Park. Note that the planning area of the West Mojave Plan covers more area than the range of the desert tortoise; for example, the western part of the planning area, along the higher flanks of the Sierra Nevada, reaches elevations where desert tortoises do not occur. The planning area also extends farther north than desert tortoises normally occur in this part of their range.

The recovery plan for the desert tortoise considered the Western Mojave Recovery Unit to be one of the most threatened units (Service 1994c). Desert tortoises in this recovery unit continue to face numerous threats. Predation by common ravens and feral dogs, mortality on paved and

unpaved roads, vandalism, and poaching continue to cause loss of individuals. The cause or causes of mortality in many individuals cannot be determined; drought, one or more diseases, and physiological stress may be factors. Appendix L of the final environmental impact report and statement (Bureau et al. 2005) notes that the cause of death could be determined for 148 of the 1,779 carcasses that were found during transect work conducted from 1998 through 2002 and during line-distance sampling conducted in 2001 and 2002. These data indicate that predation by mammals (71 individuals), crushing by off-highway vehicles (35), predation by common ravens (12), and gunshot (9) accounted for most of the identifiable causes of death on lands managed by the Bureau (see Table L-6 of Appendix L).

Based on recommendations contained in the recovery plan, the Service has been coordinating an effort to determine trends in number of desert tortoises that occur in each recovery unit. This effort, which is called line-distance sampling, relies on detecting live animals during the spring. Data from this sampling have not been fully analyzed to date. Based on density values derived from line-distance sampling conducted within the Fremont-Kramer, Superior-Cronese, and Ord-Rodman critical habitat units, Heaton et al. (2004) calculated that approximately 20,420 to 41,224 adult desert tortoises reside in the western Mojave Desert. (The Desert Tortoise Recovery Plan Assessment Committee does not consider the Pinto Mountain Desert Wildlife Management Area to be part of the Western Mojave Recovery Unit [Heaton et al. 2004]; therefore, this range does not include animals from that area.) They arrived at this estimate by multiplying the average density for each critical habitat unit by the acreage of suitable habitat that was sampled within the unit and totaling the results. Note that the sampling excludes areas over 4,200 feet in elevation and playas, where desert tortoises are not expected to live, and private lands, which are not sampled because of lack of access. Desert tortoises that reside within suitable habitat on private lands are not included in the estimate; consequently, the predicted range of the number of desert tortoises may be greater than estimated. Conversely, as we noted previously in this section, the most favorable habitat for desert tortoises occurs between 1,000 and 3,000 feet, therefore, including elevations of up to 4,200 feet in the abundance calculation may result in an overestimate of the number of desert tortoises. Finally, statistical issues with the methodology of line-distance sampling may introduce even greater variances in the estimated total than those shown in the depicted range. Regardless of the variance that may exist in these estimates, they represent the best available scientific and commercial information.

From 1998 to 2001, biologists working for the Bureau surveyed 3,362 transects covering 3,378 square miles in the western Mojave Desert (Bureau et al. 2005). The transects are generally conducted by walking a triangular transect, 0.5 mile on each side, and recording all sign (i.e., scats, burrows, or other evidence of the presence of animals) of desert tortoises. The surveyors did not find any sign of desert tortoises on 1,405 (42 percent) of the transects; the surveyors failed to detect sign in areas where desert tortoises were previously considered to be common. Map 3-8 in the final environmental impact report and statement (Bureau et al. 2005) depicts the distribution of above-average sign counts; higher sign counts generally indicate the areas that support a higher relative abundance of desert tortoises. The following sections describe the results of work related to the abundance of desert tortoises that has been conducted within and adjacent to the proposed desert wildlife management areas in the Western Mojave Recovery Unit.

Vicinity of the Pinto Mountains Desert Wildlife Management Area

The proposed Pinto Mountains Desert Wildlife Management Area is located in the southeastern portion of the Western Mojave Recovery Unit; Tracy et al. (2004) suggest that it would be more appropriately placed in the Eastern Colorado Recovery Unit. No permanent study plots are located in this proposed desert wildlife management area. Little information exists on the densities of desert tortoises in this area. Tracy et al. (2004) noted that the distribution of carcasses and live desert tortoises appeared to be what one would expect in a “normal” population of desert tortoises; that is, carcasses occurred in the same areas as live animals and were not found in extensive areas in the absence of live desert tortoises. No higher density areas were found in the proposed Pinto Mountain Desert Wildlife Management Area during the survey work conducted by the Bureau from 1998 to 2001.

Vicinity of the Ord-Rodman Desert Wildlife Management Area

The proposed Ord-Rodman Desert Wildlife Management Area is located to the southeast of the city of Barstow. The recovery plan notes that the estimated density of desert tortoises in this area is 5 to 150 animals per square mile (Service 1994c). During the survey work conducted by the Bureau from 1998 to 2001, the proposed Ord-Rodman Desert Wildlife Management Area contained three higher concentration areas, located in its eastern, northwestern, and southern corners. Three permanent study plots are located within and near this proposed desert wildlife management area. The following table contains the density estimates for these plots; the data are from Berry (1996); all data are in the approximate number of desert tortoises of all sizes per square mile.

	Stoddard Valley	Lucerne Valley	Johnson Valley
1980		176	114
1981	146		
1986		150	80
1987	178		
1990		82	18
1991	225		
1994		73	73

Berry (1996) notes that, for various reasons, surveys at the Stoddard Valley plot encountered various difficulties; some desert tortoises from this plot were taken by poachers and at least one animal became ill with upper respiratory tract disease and contained environmental contaminants. Common ravens and feral dogs have killed desert tortoises at the Lucerne Valley plot; Berry (1998) notes that little recruitment into adult size classes was occurring. Berry (1996) notes that at least two desert tortoises from the Johnson Valley plot were killed by off-road vehicle use or cattle; at least one ill and salvaged animal contained environmental contaminants.

Vicinity of the Superior-Cronese Desert Wildlife Management Area

The proposed Superior-Cronese Desert Wildlife Management Area is located north of the Ord-Rodman Desert Wildlife Management Area; two interstate freeways and rural, urban, and agricultural development separate them. No permanent study plots have been established in this area; the density of desert tortoises has been estimated through numerous triangular transects and line distance sampling efforts. The recovery plan notes that this desert wildlife management area supports densities of approximately 20 to 250 desert tortoises per square mile. The survey work conducted by the Bureau from 1998 to 2001 indicated that the western portion of the proposed Superior-Cronese Desert Wildlife Management Area did not contain any high density areas; desert tortoises seemed to be concentrated in the south-central portion of the proposed desert wildlife management area and along portions of the southern boundary of Fort Irwin.

Vicinity of the Fremont-Kramer Desert Wildlife Management Area

The proposed Fremont-Kramer Desert Wildlife Management Area is located west of the Superior-Cronese Desert Wildlife Management Area; the two desert wildlife management areas are contiguous. The recovery plan notes that the estimated density of desert tortoises in this area was 5 to 100 animals per square mile (Service 1994c). The southern portion supported the vast majority of the high density areas in the proposed Fremont-Kramer Desert Wildlife Management Area, as determined during the survey work conducted by the Bureau from 1998 to 2001.

Five permanent study plots are located within this proposed desert wildlife management area; one plot, the Interpretive Center plot at the Desert Tortoise Natural Area, is split into two subplots. The following table contains the density estimates for these plots; the data are from Berry (1996); all data are in the approximate number of desert tortoises of all sizes per square mile.

	Fremont Valley	Desert Tortoise Natural Area, Interior	Desert Tortoise Natural Area, Interpretive Center		Fremont Peak	Kramer Hills
			Inside Fence	Outside Fence		
1979		387	339	296		
1980					99	223
1981	278					
1982		332				314
1985			229	134	45	
1987	179					130
1988		195				
1989			106	80	32	
1991	101					60
1992		47				

1993			61	42	8	
1995						139
1996		18				
1997		8*	34#	23#		
2001	19*					
2002			28#	10#		

* These values represent the actual numbers of desert tortoises found on the plot and do not represent a density estimate; the data are from Berry (pers. comm. 2005).

These data are from Connor (2003).

Berry (1996) notes that the overall trend in this proposed desert wildlife management area is “a steep, downward decline” and lists predation by common ravens and domestic dogs, off-road vehicle activity, illegal collecting, upper respiratory tract disease, and environmental contaminants as contributing factors.

Summary of the Status of the Desert Tortoise in the Action Area

A decline in numbers of desert tortoises in the Western Mojave Recovery Unit can be quantitatively demonstrated. Between 1971 and 1980, 27 plots were established in California to study the desert tortoise; 15 of these plots were used by the Bureau to monitor desert tortoises on a long-term basis (Berry 1999). Generally, the plots were visited at roughly 4-year intervals to determine the numbers of desert tortoises they supported. Desert tortoises found on these plots during the spring surveys were registered; that is, they were marked so they could be identified individually during subsequent surveys. The Desert Tortoise Recovery Plan Assessment Committee (Tracy et al. 2004) evaluated data from long-term study plots in the western Mojave Desert and concluded that the population densities of adult desert tortoises exhibited a significant downward trend ($P < 0.0001$) from approximately 1975 through 2000.

Status of Critical Habitat of the Desert Tortoise within the Action Area

In the last 10 years, the Bureau has acquired more than 500,000 acres of private lands in critical habitat of the desert tortoise and wilderness areas through the California Desert Conservation Area (LaPre 2005f). These acquisitions have improved the ability of the Bureau to manage critical habitat of the desert tortoise within the California Desert Conservation Area. Additionally, to offset the impacts of the use of additional training lands at Fort Irwin, the Army has acquired slightly more than 99,000 acres within the Superior-Cronese, Fremont-Kramer, and Ord-Rodman critical habitat units (Kernek pers. comm. 2005); these lands are interspersed among public lands generally to the south and southwest of Fort Irwin. We mention these facts here because these lands have been acquired in all the recovery units in the California Desert Conservation Area; the Army’s acquisitions have also contributed to the manageability of the critical habitat units in the Western Mojave Recovery Unit.

Ord-Rodman Critical Habitat Unit. The Ord-Rodman Critical Habitat Unit covers approximately 254,142 acres. The Bureau manages approximately 202,845 acres of this area;

the State of California manages 3,245 acres. Approximately 47,483 acres are privately owned (LaPre 2005d).

Two livestock allotments lie within the boundaries of the Ord-Rodman Critical Habitat Unit. The Bureau (2004c) provided the following information regarding grazing in this critical habitat unit. Large portions of the Ord Mountain Allotment are located at 4,000 feet or higher in elevation; although the Service conducts line distance sampling up to elevations of 4,200 feet, most desert tortoises reside at elevations between 1,000 and 3,000 feet (Luckenbach 1982). A visual comparison of preliminary data points from line distance sampling (Everly 2005) and elevation maps of the Ord Mountain Allotment (Bureau 2004b) indicates that few desert tortoises have been detected at elevations over 4,000 feet. Although the areas over 4,000 feet in elevation are within the boundaries of the Ord-Rodman Critical Habitat Unit, they likely do not support the primary constituent elements of critical habitat on a widespread basis.

Two out of the five key areas on the Ord Mountain Allotment are located below 4,000 feet in elevation; consequently, these areas are of interest in assessing the baseline conditions of this critical habitat unit relative to grazing. Key Area #1 had utilization levels ranging from 10 to 50 percent on key species; the average utilization level over a 12-year period is 21 percent, which the Bureau characterizes as light. From 1988 to 1994, utilization at Key Area #5 ranged from 2.5 to 10 percent, with an average of 3 percent; the Bureau characterizes this level as non-use.

Between 1995 and 1997, the Bureau conducted utilization transects at sites other than the key areas. Most of the transects were located above 4,000 feet; however, two sites located in the southwest portions of the allotment are located below 4,000 feet and within critical habitat. Utilization levels at these two sites ranged from 12 to 68 percent, with an average close to 50 percent.

The Bureau estimates that cattle are present within critical habitat over 90 percent of the year, although 75 percent of the area they occupy is above 4,000 feet in elevation. All of the developed water sources are within critical habitat. Between 1990 and 2003, the number of head of cattle within the allotment has ranged from 145 to 385. In 6 of those years, more than 300 head were present; less than 200 were present during 4 years.

Over the last 12 years, the overall densities of key species, especially perennial bunch grasses, have decreased. Galleta grass (*Hilaria rigida*) and spiny hopsage (*Grayia spinosa*) at Key Area #1 have all but died off, probably resulting from a combination of prolonged drought and overgrazing. Desert needlegrass (*Stipa* spp.) occurs primarily within the protection of shrubs and is rarely found in inter-shrub spaces; the lack of this perennial bunchgrass in inter-shrub spaces may be an indication of the amount of grazing pressure.

Unless otherwise noted, the information in the following paragraphs is from LaPre (2005a). The Ord-Rodman Critical Habitat Unit contains three active utility corridors. Corridor G, which is 2 miles wide, lies along Interstate 40 at the northern boundary; most of the facilities associated

with the one 30-inch pipeline in this corridor are placed outside the critical habitat unit. Corridor D is 2 miles wide; it contains two 287-kilovolt power lines and one 500-kilovolt power line. Corridor H contains one 34-inch pipeline; it is 2 miles wide.

Several off-highway vehicle routes are found within the Ord-Rodman Critical Habitat Unit, which is situated between the Johnson Valley and Stoddard Valley off-highway vehicle management areas. The Western Mojave Off-Road Vehicle Designation Project, completed by the Bureau in June 2003, designated all routes as open, closed or limited in use within the critical habitat unit. The Service issued a biological opinion for this recreational use in 2003 (1-8-03-F-21, Service 2003b); this consultation evaluated the effects of route designation throughout the western Mojave Desert, including the other three critical habitat units in the Western Mojave Recovery Unit.

The Newberry Mountains Wilderness, which includes 26,453 acres, is located entirely within the critical habitat unit. The 34,315-acre Rodman Mountains Wilderness is also located within the Ord-Rodman Critical Habitat Unit.

Fremont-Kramer Critical Habitat Unit. The Fremont-Kramer Critical Habitat Unit is approximately 518,000 acres in size. The following information regarding land ownership is from LaPre (2005d). The critical habitat unit includes 65,483 acres within Edwards Air Force Base, which is outside of the action area of this biological opinion. The Bureau manages approximately 283,710 acres of this area. The State Lands Commission manages 457 acres. Approximately 163,857 acres are privately owned.

The California Department of Fish and Game's Fremont Valley Ecological Reserve consists of 1,090 acres in 5 properties. The California Department of Fish and Game also manages the West Mojave Desert Ecological Reserve, which consists of 22 properties totaling 11,817 acres northeast of Kramer Junction. The parcels managed by the California Department of Fish and Game are scattered within public lands and are thus considered to be within the action area.

The California Desert Conservation Area Plan of 1980 designated lands north of California City in Kern County as an area of critical environmental concern and a research natural area. The Desert Tortoise Research Natural Area, which includes 25,695 acres, is managed jointly by the Bureau, California Department of Fish and Game, and the Desert Tortoise Preserve Committee, a non-profit group established to acquire and manage lands for protection of the desert tortoise. The northern portion of the Desert Tortoise Research Natural Area (3,045 acres) is within the Fremont-Kramer Critical Habitat Unit.

Approximately 174 acres of the Golden Valley Wilderness is included within the Fremont-Kramer Critical Habitat Unit, just outside the southwestern corner of the U.S. Navy's Mojave B Range. The remaining wilderness extends the protected habitat to the northwest.

In past years, sheep grazed this critical habitat unit in several allotments. No sheep grazing has occurred within the vast majority of the critical habitat unit since at least the early 1990s, as a result of section 7(a)(2) consultations between the Bureau and Service. A portion of the Pilot

Knob Allotment, which was grazed by cattle, overlies this critical habitat unit. It has not been grazed for approximately 10 years; the private interests in that allotment have been acquired by a conservation group.

Contingent corridor P, which is 2 miles wide, traverses the critical habitat adjacent to Highway 395; this corridor contains two 115-kilovolt power lines, a coaxial cable, and a 12-inch pipeline. Utility corridors G and Q cross the Fremont-Kramer Critical Habitat Unit. Corridor G is 2 miles wide and contains a 30-inch pipeline. Corridor Q is also 2 miles wide; it contains a 12-inch pipeline.

Several popular off-highway vehicle routes are found within the Fremont-Kramer Critical Habitat Unit. The Rand Mountains, which are located between the Desert Tortoise Research Natural Area on the west and the Rand Mining District on the east, are extremely popular with off-highway vehicle users. The Bureau has expended considerable effort to control recreational use in this area.

Superior-Cronese Critical Habitat Unit. The Superior-Cronese Critical Habitat Unit is approximately 772,000 acres in size. The following information regarding land ownership is from LaPre (2005d). Approximately 189,304 acres are within military bases, which are outside of the action area of this biological opinion. The Bureau manages approximately 380,592 acres of this area. The State Lands Commission manages 5,530 acres; the California Department of Fish and Game manages 3,861 acres. Approximately 192,237 acres are privately owned.

The critical habitat unit is contiguous with critical habitat on the Mojave B Range of the Naval Air Weapons Station and the Fort Irwin National Training Center; however, these areas, which include 201,914 acres, are outside of the action area of this biological opinion. The Air Force's Cuddeback Gunnery Range, which is no longer in use, is entirely contained within critical habitat.

A small portion of utility corridor BB is within the southeast portion of the Superior-Cronese Critical Habitat Unit. Corridor BB is an east-west corridor, 3 miles wide, which follows Interstate 15. Major utilities located in this corridor include one 131- kilovolt transmission line, two gas pipelines, and two fiber optic cables. This corridor also includes Interstate 15. The 2-mile wide Boulder Corridor (Corridor D) also traverses this critical habitat unit. The 5-mile wide corridor Q also runs east-west through the critical habitat unit.

Several popular off-highway vehicle routes are found within the Superior-Cronese Critical Habitat Unit. Cultural sites include the 61,805-acre Black Mountain Cultural Area and the 898-acre Calico Early Man Site. The Rainbow Basin/Owl Canyon area contains a campground and highly eroded geological formations; this 4,087-acre site is popular with visitors.

The Black Mountain Wilderness overlaps 20,929 acres of the critical habitat unit. The Grass Valley Wilderness consists of 32,835 acres. Both of these wilderness areas are entirely within the critical habitat unit. Approximately 1,715 acres of the Golden Valley Wilderness are within

the Superior-Cronese Critical Habitat Unit; the remainder of the 37,700 acres adjoins the critical habitat unit on its northern edge.

Pinto Mountain Critical Habitat Unit. The Pinto Mountain Critical Habitat Unit is approximately 171,700 acres in size. The following information regarding land ownership is from LaPre (2005d). Joshua Tree National Park includes 19,329 acres within this critical habitat unit; however, it is outside of the action area of this biological opinion. Approximately 111,668 acres of the critical habitat unit are within the planning area for the West Mojave Plan; the remainder of the critical habitat unit lies within the boundaries of the Northern and Eastern Colorado Desert Coordinated Management Plan. The Bureau manages approximately 103,771 acres of this area. The State of California owns 5,633 acres; the State Lands Commission, California Department of Fish and Game, and California Department of Parks and Recreation manage these lands. Approximately 2,264 acres are privately owned.

Within the public lands, the Bureau manages 683 acres as Class C and 109,510 acres as Class M. This area currently does not contain any Class L or I lands. Unclassified lands comprise 1,502 acres.

The northwestern corner of the critical habitat unit is within the city of Twentynine Palms. This segment contains nearly all of the private land within the Pinto Mountain Critical Habitat Unit.

This area represents a transition between Colorado Desert and Mojave Desert flora and fauna. Wash species include smoke trees (*Dalea spinosa*), palo verdes (*Cercidium* spp.), and ironwoods (*Olneya tesota*). Ocotillo and barrel cacti are present, though these species are more common to the south.

This critical habitat unit does not contain any livestock allotments or utility corridors. Off-highway vehicle routes are utilized primarily by prospectors, rockhounds, and claimholders.

Most of the Pinto Mountain Critical Habitat Unit is within the Old Dale Mining District. Many small-scale historical mines are present.

A small portion of the Sheephole Valley Wilderness lies within the critical habitat unit. It occupies approximately 683 acres.

Summary of the Status of Critical Habitat of the Desert Tortoise in the Action Area

The four critical habitat units within the Western Mojave Recovery Unit contain numerous types of habitats, cover the full range of the elevations used by desert tortoises, and are subject to varying degrees of human use. The proximity of the Los Angeles Basin is responsible for making the Western Mojave Recovery Unit important to recreational users and economic interests. Despite this level of use, large areas of critical habitat in the western Mojave Desert remain undisturbed. We base this statement on information provided by the Bureau that was gathered in support of the West Mojave Plan. Using aerial photographs from 1994 of the proposed desert wildlife management areas in the planning area for the western Mojave Desert

region, the Bureau used numerous conservative calculations (i.e., it erred on the side of overestimating the amount of disturbance) and concluded that approximately 1.3 percent of the proposed desert wildlife management areas has been disturbed to date (LaPre 2005c). We acknowledge that the critical habitat units and desert wildlife management areas do not overlap completely; however, this information comprises the best available data with regard to surface disturbance in the planning area. At this level of disturbance, we anticipate that the critical habitat units should function fully to support the conservation of the desert tortoise.

We have historically measured the degree of functionality of the primary constituent elements of critical habitat of the desert tortoise by evaluating the amount of ground disturbance. In recent years, however, research conducted by Oftedal (2005) indicates that other, more subtle changes in some of the primary constituent elements may also be important. Oftedal postulates that changes in the composition of annual plants, from certain native species that are high in protein and water to less nutritive non-native species, may be placing desert tortoises in a state of chronic stress. At this time, we continue to consider that evaluation of the degree of ground disturbance is the most pertinent indicator of the health and status of the critical habitat units; however, we should closely track the development of new information with regard to environmental factors and how they may affect the physiology of desert tortoises.

EFFECTS OF THE ACTION ON THE DESERT TORTOISE AND ITS CRITICAL HABITAT

Methodology

We conducted our analysis in a stepwise fashion. We began our analysis with a general description of how various anthropogenic activities could affect the desert tortoise and its habitat, including the primary constituent elements of its critical habitat.

We then analyzed the effects of the actions proposed in the amendment to the California Desert Conservation Area Plan for the western Mojave Desert. We did not analyze the effects of any site-specific future actions that are beyond the scope of this plan amendment. As the California Desert Conservation Area Plan notes, site-specific actions may be allowed after they are analyzed pursuant to the National Environmental Policy Act; the Bureau must also comply with section 7(a)(2) of the Act when it is considering these future actions. Because the California Desert Conservation Area Plan also provides the fundamental authorization for many ongoing activities, such as casual recreational use, that do not require site-specific analysis by the Bureau, we analyzed the effects of this type of activity. We conducted our analysis of all of these effects, whether beneficial or adverse, to the desert tortoise and its critical habitat within the action area in relation to its survival and recovery needs and to the function of designated critical habitat, respectively.

We note that the Bureau's proposed action includes many types of actions that may affect the desert tortoise and its critical habitat over a very large area. In such cases, we frequently do not have extensive data upon which to base our analyses. In developing this biological opinion, we used the best available information as described and required by the implementing regulations for section 7(a)(2) of the Endangered Species Act. Specifically, 50 *Code of Federal Regulations*

402.14(d) requires the Federal agency requesting formal consultation to provide us “with the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species or critical habitat.” The consulting Federal agency bears the responsibility, “to the extent practicable,” to obtain the requested data “which can be developed within the scope of the extension” (50 *Code of Federal Regulations* 402.14(f)). Finally, 50 *Code of Federal Regulations* 402.14(g)(8) states that “In formulating its biological opinion, any reasonable and prudent alternatives, and any reasonable and prudent measures, the Service will use the best scientific and commercial data available and will give appropriate consideration to any beneficial actions taken by the Federal agency or applicant, including any actions taken prior to the initiation of consultation.”

The Bureau will consult on each future action that it proposes to approve, undertake, or fund, pursuant to the requirements of section 7(a)(2) of the Act, if the action may affect a listed species or critical habitat. Although this biological opinion may conclude that the proposed amendment of the California Desert Conservation Area Plan is not likely to jeopardize the continued existence of the desert tortoise or adversely modify its critical habitat, a specific action may be proposed in the future that could result in a finding of jeopardy or adverse modification of critical habitat. Such a circumstance could occur when permit applications contain project-specific details that cannot be evaluated at this programmatic level.

Finally, we have indicated, in the Effects to the Desert Tortoise sections of the following analyses, whether the action being discussed is fundamentally authorized by the California Desert Conservation Area Plan or whether future approvals by the Bureau are required. In the former case, the action will become effective with the signing of the record of decision for the West Mojave Plan (e.g., establishment of the desert wildlife management areas) or is a casual use (e.g., individuals driving vehicles on routes that are designated as open). In the latter case, the Bureau has discretionary authority over the implementation of future actions (e.g., mining plans of operation).

General Effects of Human Activities on the Desert Tortoise and its Critical Habitat

Numerous activities are likely to occur as a result of implementing the management actions proposed in the West Mojave Plan. These activities have the potential to adversely affect the desert tortoise and its critical habitat by: injuring or killing individuals; disrupting their breeding, feeding, or sheltering behavior; and by disturbing or degrading the primary constituent elements of critical habitat.

Effects of Human Activities on the Desert Tortoise

Vehicles that are driving on paved and unpaved roads and cross-country can strike desert tortoises (Boarman and Sazaki 1996). Cross-country travel can also result in the destruction of burrows; desert tortoises could either be trapped inside the burrows or find them unavailable when they are needed to escape predation or extreme weather conditions. In general, cross-country travel occurs less frequently than travel on roads but can cause substantial impacts

because of the presence of burrows and the greater difficulty in detecting and avoiding desert tortoises.

In most areas on public lands within the planning area, the Bureau has restricted the use of vehicles to designated routes; consequently, cross-country travel should not occur in most areas on a casual basis. The final environmental impact report and statement notes, however, that cross-country travel was observed on 833 of 1,572 (53 percent) transects that were conducted to assess the distribution of desert tortoises within the Fremont-Kramer and Superior-Cronese desert wildlife management areas. This unauthorized use, which can affect the desert tortoise as we described previously in this section of the biological opinion, is an indirect effect of the authorized access that the Bureau provides through its system of open routes.

Whether it is on a road or not, hatchling desert tortoises are the most difficult individuals to detect. Hatchlings may be somewhat less susceptible to being killed on roads because their territories are presumably smaller, they may move around less, and therefore be less likely to encounter a road. On the other hand, their propensity to be more active during cooler times of the year may extend the periods during which they are at risk of vehicle strikes.

We are unaware of any research that conclusively shows the density at which roads would be likely to extirpate desert tortoises from a region; based on their research, Hoff and Marlow (2002) contend that a large portion of an area conserved for desert tortoises in Nevada is degraded by heavily used roads. Although they showed that less frequently traveled unpaved roads also affect the distribution of desert tortoise sign, we cannot extrapolate this information directly to roads elsewhere because of varying factors, such as the amount of traffic, the density of desert tortoises, and probably, to some extent, the local terrain. Intuitively, fewer desert tortoises are likely to be killed if fewer roads are available for travel. Factors other than density also likely enter into the effects of roads; for example, few desert tortoises are likely killed on a lightly used road but this number may rise if the road becomes more heavily used as a result of closures elsewhere. Conversely, at some point, vehicle use on roads (combined with other activities that accompany vehicle use) would likely reduce the number of desert tortoises to a point where the level of mortality also decreases, simply because fewer desert tortoises live in the region. At the present time, desert tortoises seem to have become so rare in areas where they were formerly abundant that they are unlikely to be struck by vehicles.

Although desert tortoises are generally more easily observed on roads, vehicles can travel at increased speed that again reduces the ability of drivers to detect and avoid desert tortoises. Rises and turns in roads also decrease the ability of drivers to detect desert tortoises. The actual level of injury or mortality that would occur along a specific road will be influenced by many variables and is difficult to predict; the level and type of use of the road by vehicles and the number of desert tortoises present during periods of heavy use are two of the primary factors that are difficult to predict. Mortality associated with vehicle strikes, both on and off roads, will be greatest in the spring and fall, in areas where desert tortoises are most common. Along heavily used roads, the number of desert tortoises is depressed for some distance from the edge of the road as a result of road-associated mortality; this distance varies with the level of use of the road. For example, Hoff and Marlow (2002) found that “reductions in (desert) tortoise sign are easily

detectable more than (2.48 miles) from the roadway” on heavily used paved roads. They also found “evidence from unpaved utility access roads ... that even lower traffic levels may have a significant detectable impact.” Of the roads that Hoff and Marlow (2002) investigated, only a poorly maintained paved road, with a traffic volume of approximately 25 vehicles per day seemed to have no effect on the distribution of sign of the desert tortoise.

In the western Mojave Desert, the Bureau has authorized the use of some washes as designated routes of travel; vehicles using washes may kill or injure desert tortoises. The risk to desert tortoises of being struck by a vehicle while in a wash may be different than that associated with a road. For example, desert tortoises are likely more difficult to see when they are in washes because of the generally greater variation in contours and substrates in washes as compared to those on roads; desert tortoises likely also spend more time in washes than on roads because washes support resources that they require, such as shrubs for cover and annual plants for forage. However, vehicles traveling on roads usually do so at greater speeds than can be used in washes, thus reducing the ability of the driver to see desert tortoises; finally, more vehicles use roads than washes. Note that these statements are generalizations and exceptions likely apply to each statement. Desert tortoises may use washes to varying degrees in different portions of their range; therefore, the likelihood that any given wash supports desert tortoises at densities greater than the surrounding desert would depend on the location of the wash.

The final environmental impact report and statement contains additional discussion regarding the effects of roads on desert tortoise populations. It reaches the conclusion that, despite many studies showing reduced numbers of desert tortoises near roads, an absolute connection between the presence of roads and the status of the desert tortoise is difficult to make. For example, the presence of other factors in the area, such as sheep grazing and disease, may also contribute to local declines in the number of desert tortoises. Regardless of the difficulty in linking declines in the status of desert tortoise populations to the effects of vehicle use, the final environmental impact report and statement notes that, in two surveys, vehicles were responsible for crushing 28 of 104 (27 percent) and 14 of 44 (32 percent) desert tortoises where the cause of death could be ascertained. Consequently, based on this information, the level of mortality of desert tortoises attributable to vehicles is not insignificant.

Desert tortoises would be at risk during the construction, operation, and maintenance phases of any projects that would employ large equipment. Animals can be crushed on the ground’s surface, trapped in their burrows, and buried in overburden piles. During the construction of the Kern and Mojave pipelines, numerous desert tortoises were killed by vehicles traveling to and from the project sites on the rights-of-way; although this mortality was not directly caused by the heavy equipment at the construction sites, the right-of-way traffic was occurring in direct support of that activity.

Because of their small size, hatchlings and slightly larger desert tortoises could be trampled by foot traffic of people working or recreating in the desert. Nests are also vulnerable, but their typical location, near the mouth of a burrow, likely protects them to some degree.

Desert tortoises have died as a result of other factors associated with human activities. They have fallen into trenches that were excavated for various types of projects and into mine shafts. Approximately 45 desert tortoises were rescued from abandoned mine shafts on one weekend in the El Paso Mountains in 1983 (Aardahl pers. comm. 2005); in the mid-1990s, we heard of similar rescues of smaller numbers of desert tortoises from mining excavations near Daggett Ridge. Improperly constructed cattle guards can also trap smaller individuals. Desert tortoises have become entangled in netting or wire. Desert tortoises may seek shelter in the shade of vehicles and be crushed when those vehicles are subsequently moved. Improper disposal of food wastes and trash often attracts predators of the desert tortoise, especially common ravens. Pet dogs brought onto public lands by recreationists or workers associated with specific projects can disturb, injure, or kill desert tortoises. Desert tortoises have also been found trapped in guzzlers and between the rails of a railroad track.

Some ill, dying, and recently dead desert tortoises have been found to contain elevated levels of potential toxicants, such as cadmium, chromium, mercury, nickel, and lead (Jacobson et al. 1991, Homer et al. unpublished data in Chaffee and Berry 1999). Chaffee and Berry (1999) compared concentrations of elements found in plants and soils and found elevated concentrations of cadmium, potassium, and zinc in all plants; other elements, such as chromium, nickel, and selenium were enriched only in certain plants. Because desert tortoises seem to forage selectively on certain plant species, they may eat or avoid those species containing elevated levels of potential toxicants. They also found anomalous concentrations of arsenic, which could be toxic to desert tortoises in large quantities, near areas that have been mined for gold; arsenic occurs in some gold ores. Avery (1998) notes that concentrations of heavy metals, such as chromium, iron, copper, zinc, and aluminum, were higher in Mediterranean grass (*Schismus barbatus*) than in evening-primrose (*Camissonia boothii*), four o'clocks (*Mirabilis bigelovii*), or filaree (*Erodium cicutarium*). Avery (1998) found that Mediterranean grass had greater concentrations of chromium, iron, copper, zinc, and aluminum than the latter three species. He speculated that, because its fibrous roots are near the surface of the soil, it may accumulate heavy metals that are deposited from airborne pollution more readily than the other species, which have tap roots. Mediterranean grasses (*S. barbatus* and *arabicus*) are widely distributed, non-native plants that are common in disturbed soils and readily consumed by desert tortoises. To date, although desert tortoises seem to have been exposed to elevated levels of potentially toxic elements, we do not know if this exposure has caused any adverse effects.

The use of pesticides could result in direct mortality of desert tortoises; we are unaware of specific studies regarding the effects of pesticides on the desert tortoise. Herbicides may reduce or eliminate the abundance of plants that the desert tortoise uses for forage or shelter; other pesticides could reduce the abundance of pollinators, which, in turn, could reduce the germination success of plant species that are important to the desert tortoise. Both the active ingredient and surfactants may be toxic to desert tortoises, plant species that it uses for forage and shelter, and the pollinators of these plant species.

Through legitimate and authorized use of desert lands, people make contact with desert tortoises. This contact can lead to uninformed or malicious interactions that result in injury or mortality of desert tortoises. For example, unauthorized handling or restraint of a desert tortoise could induce

physiological stress that reduces the animal's ability to withstand high temperatures. Desert tortoises are occasionally killed by gunshots. Some mortality associated with gunshots may be accidental; however, most are probably intentional simply because of the low likelihood of a bullet randomly striking a desert tortoise. Although this consultation addresses only legal actions that are implemented or authorized by the Bureau, the access provided by the Bureau's authorizations can increase the number of adverse interactions between desert tortoises and people.

The presence of people in the desert has provided subsidies that allow at least some species, including some predators of the desert tortoise, to be present in greater numbers than they were prior to the development of cities, towns, agriculture, and other human features. Perhaps most importantly, the number of common ravens in the Mojave Desert increased ten-fold between 1968 and 1992 (Boarman and Berry 1995). Common ravens find human-produced subsidies in many forms; they nest on power pylons, drink at artificial water sources, and eat road-killed animals, refuse at landfills, and the products of agricultural areas. Activities that the Bureau authorizes under the auspices of the California Desert Conservation Area Plan have the potential to add to these subsidies. Although alterations to habitat have increased the number of common ravens, we included a discussion of these in this section because the indirect impact of subsidies to the desert tortoise is an increased level of predation, which was, as we mentioned in the Status of the Species section of this biological opinion, one of the factors that influenced the listing of the species as threatened.

Human activities in the desert increase the spread of non-native plants. These species can increase the ability of the desert to carry wild fires (Lovich and Bainbridge 1999). Desert tortoises are not adapted to fire; consequently, fires could result in a substantial loss of desert tortoises.

In summary, desert tortoises may be killed or injured by a wide variety of human activities that the Bureau can authorize under the auspices of the West Mojave Plan. The number of desert tortoises that may be killed or injured by any given activity depends on a variety of factors. The nature of the activity, its location and timing, and the density of desert tortoises in the action area are key factors that affect the number of animals that may be killed or injured. Given the broad nature of this consultation, we are unable to estimate the number of desert tortoises that may be killed or injured. However, we note that, because desert wildlife management areas and critical habitat were established to include the largest aggregations of desert tortoises, activities occurring in these areas are generally more likely to kill or injure desert tortoises than those occurring outside their boundaries.

Finally, to restate the methodology we are using in this biological opinion, the discussion in this section provided a general overview of the effects of human activities on the desert tortoise; we did not intend for this overview to address the scale or intensity of potential impacts associated with implementation of specific activities proposed in the West Mojave Plan. A complete analysis of the actions proposed in the West Mojave Plan, including addressing the scale of the potential effects, is contained in the Effects of the West Mojave Plan on the Desert Tortoise and its Critical Habitat section of this biological opinion.

Effects of Human Activities on Critical Habitat

The final rule designating critical habitat for the desert tortoise describes the specific primary constituent elements of its critical habitat. These primary constituent elements are: sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper substrate conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality (59 *Federal Register* 5820).

The implementation of the guidelines and elements of the California Desert Conservation Area Plan can remove, disturb, or fragment habitat of the desert tortoise, including the primary constituent elements of critical habitat. We conducted the following analysis by generally using the primary constituent elements as the basis for our discussion.

Note that, regardless of whether a specific area is within the boundaries of critical habitat, various activities generally affect the physical and biological attributes of habitat that supports desert tortoises in the same manner. In the analysis that follows and throughout the biological opinion, we discuss how the primary constituent elements of critical habitat of the desert tortoise may be affected by various activities. The same principles apply to suitable habitat that has not been designated as critical by the Service. Therefore, for example, livestock grazing has the same general effects on desert tortoise habitat, regardless of whether that habitat has been designated as critical. For the purposes of this biological opinion, we do not consider the effects on habitat outside of critical habitat in our conclusions regarding any effects to designated critical habitat.

Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow. This primary constituent element addresses the need to conserve sufficiently large areas to maintain the ecological processes that are necessary to support the recovery of the species. The final rule designating critical habitat also notes that these large reserve areas allow desert tortoises to move, disperse, and maintain gene flow.

We will conduct a specific analysis of the desert wildlife management areas proposed by the Bureau and the means by which the Bureau proposes to maintain the viability of these areas later in this document. At this point in our review, we note that the implementation of the West Mojave Plan has the potential to reduce the amount of space that is available to the desert tortoise to recover. Such reductions can result from disturbance or removal of habitat by a variety of means and scales. For example, the installation of a small informational kiosk at the side of a road to provide information to recreationists may cause the loss of a few hundred square feet of suitable habitat. However, this loss, in and of itself, is inconsequential in relation to the acreage of suitable habitat in any given desert wildlife management area; in fact, the possibility exists that the benefits to the desert tortoise of a more informed public may outweigh any adverse effects of the habitat loss.

Conversely, removal of habitat on a sufficiently large scale can eliminate the ability of entire regions to support desert tortoises. In the worst cases, such large removals may also fragment and isolate additional aggregations of desert tortoises. Such isolation or fragmentation reduces the ability of desert tortoises to move over large areas in response to changes in habitat conditions, prevents genetic interchange, and substantially reduces the likelihood of the re-establishment of desert tortoises in the event of local extirpations. Desert tortoises may be substantially isolated from larger populations by natural features, such as mountain ranges or low valleys, or, in more limited circumstances, by canals, roads, and other human activity. Although the adverse effects of isolation are likely to outweigh the benefits over the long term, isolated groups of desert tortoises may be less susceptible to the transmission of disease on a short-term basis. Few areas that support desert tortoises are likely completely isolated from all other populations. For example, desert tortoises occasionally cross even the busiest roads during periods of low traffic or when assisted by concerned motorists.

Heavily used roads, even if they do not pose a physical barrier to desert tortoises, cause fragmentation because animals cannot cross them safely. Some roads, such as Highway 58, have been fenced to exclude desert tortoises and fitted with underpasses that allow animals to move from side to side; such roads may reduce mortality levels and allow passage of animals to the degree that the potential has increased for the desert tortoise to recover in these areas (Boarman et al. 1998).

Unpaved roads that are used infrequently likely do not pose a threat of fragmentation. However, ongoing road maintenance can lower the bed of the road and raise berms to a degree that desert tortoises which enter the roadway cannot exit. These animals are subsequently threatened with predation, exposure to extreme temperatures, collection, and collision with vehicles.

Sufficient quality and quantity of forage species and the proper substrate conditions to provide for the growth of these species; and sufficient vegetation for shelter from temperature extremes and predators. We have combined a discussion of the potential effects of implementation of the West Mojave Plan on these two primary constituent elements because they both deal with the plant communities that support desert tortoises; additionally, the effects are similar in that the disturbance or removal of annual and perennial plants often occurs as a result of the same activities.

The most direct and obvious potential effect of the implementation of the West Mojave Plan is the direct removal of annual and perennial plants that desert tortoises use for food and cover. When such effects occur within the boundaries of critical habitat, the specific primary constituent elements that may be affected are the quality and quantity of forage species, the proper substrate conditions to provide for the growth of these species, and vegetation for shelter from temperature extremes and predators. Simply stated, the disturbance or removal of annual plants and shrubs reduces the ability of the desert tortoise to find food and shelter. Without a diverse assemblage of plant species upon which to forage, desert tortoises cannot maintain an appropriate nutritive balance (Oftedal 2005); without the cover of shrubs, desert tortoises are more vulnerable to predators and the temperature extremes that are common in the desert. Note that the discussion of the effects of livestock grazing on desert tortoises and their habitat, which is located under the

analysis of the livestock grazing element, contains a more detailed evaluation of the relationship between desert tortoises and their habitat.

Numerous activities can result in the removal or disturbance of vegetation at varying scales and intensities. For example, parking of vehicles off of established routes may crush shrubs or annual species and affect smaller amounts of habitat on a relatively short-term scale. Large-scale mines, on the other hand, generally cause the complete removal of plant communities over substantial areas, most likely on a permanent basis. Note that the degree of restoration at a large mine is subject to some variation; substantial efforts to restore habitat have occurred at Viceroy Mine in the eastern Mojave Desert but reclaiming as habitat the pit made by U.S. Borax at Boron is likely impossible.

In general, short-term disturbances that cover small areas likely do not cause an appreciable reduction in the value of habitat to support desert tortoises; however, if such disturbances are repeated numerous times in a localized area, the aggregate effects of this disturbance are likely to result in the complete loss of habitat value. Large-scale removal of habitat renders the area completely unsuitable for desert tortoises; in the worst case, large areas of removal of habitat may fragment and isolate aggregations of desert tortoises.

Suitable substrates for burrowing, nesting, and overwintering; and burrows, caliche caves, and other shelter sites. We have combined a discussion of the potential effects of implementation of the West Mojave Plan on these two primary constituent elements because they both deal with shelter sites; additionally, the potential effects to these primary constituent elements are similar in that the disturbance or removal of shelter sites or the substrates in which they are constructed often occurs as a result of the same activities.

The use of heavy equipment and driving of vehicles off of designated routes causes compaction of substrates. If the level of compaction is sufficient, substrates could become unsuitable for burrowing by desert tortoises. Additionally, the complete removal of all available habitat from an area would preclude the construction of burrows by desert tortoises. If the local area affected by human activities is extensive, desert tortoises may be precluded from using that area on a long-term basis.

Vehicle use or other ground disturbance, such as construction activities, in areas where caliche caves are present can result in the destruction of these shelter sites. Caliche caves are an important resource for desert tortoises; individuals often use the same caves for extended periods of time. Additionally, desert tortoises cannot construct caliche caves as they do burrows; instead, they are dependent upon finding appropriate sites. Consequently, their loss may have a longer term effect on a desert tortoise than the loss of a burrow.

Most burrows of desert tortoises occur in areas that exhibit less topographical relief than do sites where caliche caves are present. Consequently, cross-country travel by vehicles can result in the destruction of burrows.

In general, the loss of shelter sites renders desert tortoises more vulnerable to predation and exposure to the temperature extremes that are common in the desert. Additionally, if desert tortoises spend time constructing new burrows, they are likely less able to seek mates or spend appropriate amounts of time foraging. Potentially, if desert tortoises are frequently forced to construct new burrows, their energy budgets may be adversely affected.

Habitat protected from disturbance and human-caused mortality. The establishment of open routes and development of various facilities have the potential of increasing the degree to which people interact with desert tortoises and of affecting the other primary constituent elements of their critical habitat. Even if proposed actions are planned carefully and potential impacts to desert tortoises and their habitat carefully considered, their proximity to the primary constituent elements increases the potential that some effects, whether direct or indirect, may accrue to critical habitat. In addition, the indirect effects of at least some development activities often lead to increased disturbance of habitat and human-caused mortality (e.g., stray and feral dogs from housing developments kill desert tortoises beyond the foot print of the housing, common ravens attracted to a poorly managed landfill consume desert tortoises for miles around the site); at times, these indirect effects cause more serious and long-term degradation of habitat value than the initial action.

Additional effects of human activities on critical habitat. The final rule designating critical habitat for the desert tortoise did not include a specific primary constituent element that discussed invasive non-native plant species. However, we have recognized that, in recent years, the desert is being continually invaded by such species.

Disturbance of substrates that can result from implementation of many of the elements of the West Mojave Plan can accelerate the spread of invasive non-native plant species by destruction of substrate crusts and cryptogams; these non-native species, in turn, can compete with the native plant species (Lovich and Bainbridge 1999) that the desert tortoise requires for nutrients and shelter. Non-native plants can also increase the ability of the desert to carry wild fires (Lovich and Bainbridge 1999). The plant species upon which desert tortoises depend are not adapted to fire; consequently, fires could severely alter the plant community structure by removing species upon which the desert tortoise is dependent and facilitating the spread of fire-tolerant taxa.

In summary, desert tortoise habitat (including both its critical habitat and other areas not so designated) may be disturbed or removed by a wide variety of human activities that the Bureau can authorize under the auspices of the West Mojave Plan. The amount and quality of the habitat that may be disturbed or removed by any given activity depends on a variety of factors. The nature of the activity, its location, and the quality of the habitat in the action area are key factors that determine the extent and intensity of the effect on the primary constituent elements of critical habitat and habitat of the desert tortoise in general. Given the broad nature of this consultation, we are unable to estimate the amount of desert tortoises that may be disturbed or removed, other than that the Bureau has proposed to limit the amount of new ground disturbance to less than one percent of the area within each desert wildlife management area. However, we note that, because desert wildlife management areas and critical habitat were established in the best quality habitat for desert tortoises, activities occurring in these areas are generally more

likely to disturb or remove habitat that supports desert tortoises than those occurring outside their boundaries. Note that, through the amendments to the California Desert Conservation Area Plan, the Bureau has changed the multiple-use class within desert wildlife management areas from Class M to Class L; as noted previously in this biological opinion, lands within Class L include areas that are managed to provide for lower density, carefully controlled multiple uses of resources while ensuring that sensitive values are not significantly diminished.

Effects of the West Mojave Plan on the Desert Tortoise and its Critical Habitat

The area where the desert tortoise may be affected by the Bureau's proposals includes all public lands within the planning area that have been designated as its critical habitat, plus all public lands upon which it occurs that are outside of the boundaries of critical habitat. These latter areas certainly do not include all public lands in the planning area; for example, the Bureau manages lands, such as in Summit Valley and at Middle Knob, that are well outside the expected range of the species. Because desert tortoises occur so patchily within their range, but particularly so outside of critical habitat, defining a precise action area is difficult. As we noted previously in this biological opinion, non-federal lands that support desert tortoises and are intermixed with public lands are considered to be part of the action area.

Amendment 1, New Areas of Critical Environmental Concern

The Bureau will designate new areas of critical environmental concern to conserve listed species, sensitive species, and areas that protect groups of species or important habitat. The four desert wildlife management areas that will be designated for the desert tortoise (i.e., Fremont-Kramer, Superior-Cronese, Ord-Rodman, and Pinto Mountain) include, in total, 1,023,329 acres of public lands.

The Bureau's general management strategy includes a one percent limit on cumulative ground disturbance within areas of critical environmental concern, adoption of management prescriptions and measures to reduce the effects of proposed projects on the desert tortoise and its critical habitat, a program to reduce predation by common ravens on the desert tortoise, a requirement for project proponents to compensate for loss or disturbance of habitat of the desert tortoise, and numerous other features. These additional features are listed in the Description of the Proposed Action section of this biological opinion and more fully described in the final environmental impact report and statement.

Effects on the Desert Tortoise

The Bureau's designation of areas of critical environmental concern provides the framework to identify clearly the management objectives of these desert wildlife management areas. It also serves as an informational guide to users of the desert that future uses, activities, or management practices must be compatible with the recovery of the desert tortoise. This designation will not have direct, on-the-ground effects, on the desert tortoise; however, it appropriately sets the stage for future management of public lands and the implementation of recovery actions for the desert

tortoise. On that basis, this portion of the West Mojave Plan is very beneficial to the desert tortoise.

In addition to the four desert wildlife management areas, the Bureau's proposal to establish conservation areas for other species may provide some conservation value for the desert tortoise. In the following paragraphs, we do not discuss conservation areas that overlap desert wildlife management areas established for the desert tortoise because they are not likely to provide substantially increased protection.

The Bendire's Thrasher Conservation Area, which lies within the sphere of influence of the Town of Apple Valley in northern Lucerne Valley, includes 8,908 acres of public lands. Within this area, the one percent limitation on new ground disturbance, retention of public lands, and designation of vehicle routes will protect desert tortoises to some degree. The number of desert tortoises within this area is likely relatively low.

A conservation area for the Mojave monkeyflower (*Mimulus mohavensis*) in Brisbane Valley includes 10,633 acres; this entire area comprises lands managed by the Bureau. The Bureau's proposals to retain public lands in this area, designate routes of travel, amend its land tenure adjustment program to remove these public lands from the disposal zone, change the multiple use class from Unclassified and Class I to Class L, implement mitigation and monitoring procedures, and discontinue sheep grazing in this area will improve the likelihood that desert tortoises will persist in this area. Although this parcel is isolated from larger areas of desert tortoise habitat, desert tortoises are likely to persist in this area with the proposed level of management. The Mojave Monkeyflower Conservation Area likely supports at least medium densities of desert tortoises.

Within the 14,224-acre Pisgah Conservation Area, desert tortoises occur in lava flows, which is an uncharacteristic habitat type for this species. The Bureau's proposal to designate routes within the area of critical environmental concern as open or closed, restore or block routes to be closed, and change the multiple use class from M to L will likely reduce threats to desert tortoises in this region. Although the density of desert tortoises in this area is likely not great, maintaining desert tortoises in an area where they exist in an unusual ecological setting, such as the lava flows, is important in conserving the full range of habitats and behavioral adaptations that the species exhibits in the Western Mojave Recovery Unit.

Finally, the Carbonate Endemic Plants Research Natural Area, on the north slope of the San Bernardino Mountains, includes 4,393 acres of lands managed by the Bureau. Within this area, lands will be subject to a standard of no surface occupancy to prevent undue and unnecessary degradation under the surface mining regulations, private lands within the proposed area of critical environmental concern may be purchased or exchanged for Bureau lands in Lucerne Valley, acquired lands will not be opened to mineral entry, and the multiple use class will change from Class M to L. These changes in the California Desert Conservation Area Plan will benefit the relatively low density of desert tortoises in this area, which are likely to occur at the lower elevations of the area of critical environmental concern. As we mentioned in the previous paragraph, the conservation of desert tortoises in this area is important in conserving the full

range of habitats and behavioral adaptations that the species exhibits in the Western Mojave Recovery Unit because these animals exist at the edge of the natural range of the species.

Limiting the amount of cumulative ground disturbance to one percent of the public lands in each of the desert wildlife management areas will likely ensure that proposed actions do not cause injury to or mortality of a large number of desert tortoises. Conversely, approximately 99 percent of the area inhabited by desert tortoises within the desert wildlife management areas will remain undisturbed; this lack of disturbance to the majority of the area inhabited by desert tortoises should ensure that large numbers of individuals are not disturbed by activities associated with specific projects. The following table depicts the amount of habitat in each of the desert wildlife management areas that may be disturbed and conserved as a result of the proposed action.

Desert Wildlife Management Area ¹	Acres of Habitat to be Conserved	Acres of Habitat that may be Disturbed
Superior-Cronese	610,157	6,163
Fremont-Kramer	489,773	4,947
Ord-Rodman	245,837	2,483
Pinto Mountain	115,949	1,171
Total	1,461,716	14,764

¹ Acreages are based on information in Table 4-6 of the final environmental impact report and statement.

The actions discussed in the preceding paragraphs will be authorized under the California Desert Conservation Area Plan and would become effective upon the Bureau's signing of the record of decision. Consequently, the Bureau and Service will not consult on these issues again, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16.

Given the success that the Bureau generally has had in reducing the number of desert tortoises killed or injured during the implementation of proposed actions, combined with these limitations on the amount of activity that will be permitted in these desert wildlife management areas, we anticipate that few desert tortoises are likely to be killed or injured during future project-specific activities. We cannot, at this time, predict how many desert tortoises are likely to die or be injured as a result of actions proposed within the one percent limit on habitat loss or disturbance because we do not know the location of such actions, the number of desert tortoises in these areas, and other specific attributes of any given future action. Such effects will be analyzed in future section 7(a)(2) consultations on specific projects developed under the direction of the California Desert Conservation Area Plan, as appropriate.

Through numerous consultations, the Bureau, Service, and others have developed management prescriptions and protective measures to reduce the effects of proposed projects on the desert tortoise; in general, these measures seem to be effective. The Bureau's adoption of such measures should, in general, ensure that projects implemented throughout occupied habitat of the

desert tortoise in the planning area for the western Mojave Desert are implemented in a manner that reduces adverse effects to individuals. Note that these measures are not actions, in and of themselves, and will be implemented, as necessary, in conjunction with future activities. We cannot, at this time, predict how effective any given measure will be because of the large degree of differing circumstances that surround future actions.

The Bureau's requirement that project proponents compensate for loss or disturbance of habitat of the desert tortoise within desert wildlife management areas at a ratio of five acres of acquisition for every acre adversely affected will promote the conservation of the desert tortoise. This requirement will assist the Bureau in acquiring non-federal lands. Once acquired, the provisions of section 7(a)(2) would be in force; the consultation mandate for Federal agencies provides greater protection to listed species than the prohibitions contained in section 9 of the Act. Additionally, the Bureau can close roads and regulate other activities on acquired parcels and ultimately reduce the level of threat to desert tortoises.

Mining and Access for Mining Exploration. Mining and access for mining exploration conducted under the casual use provisions of the California Desert Conservation Area Plan will be limited to public roads and designated open routes unless otherwise permitted under a plan of operations approved by the Bureau. Desert tortoises could be crushed by the foot traffic of operators or equipment during exploration. Without off-road vehicle use, the amount and size of other equipment that may be employed during casual use is likely to be limited. For this reason, the number of desert tortoises that may be killed as a result of casual use within the Western Mojave Recovery Unit is likely to be limited.

Note that casual use without specific approval by the Bureau may occur in any area that is open to mineral entry; therefore, site-specific consultation will not occur on casual use activities and the Bureau likely does not have data on the level of use. Given commercial and recreational interest in mineral exploration, this type of casual use is likely fairly common in areas that may have potential to contain geothermal, oil, gas, or mineral resources. Maps 11 through 15 in the California Desert Conservation Area Plan (Bureau 1999) depict areas within the planning area for the western Mojave Desert that have been identified as potential or known resource areas for various types of mineral and energy; based on a visual comparison of these maps with areas known to support desert tortoises, a substantial amount of overlap seems to exist.

In summary, casual use related to mining operations in the Western Mojave Recovery Unit likely occurs in a scattered fashion throughout the area occupied by desert tortoises. Because of the low-intensity nature and localized scale of activities involved with casual use, few desert tortoises are likely to be killed or injured as result of activities implemented under the authorization provided by this element of the California Desert Conservation Area Plan. We do not anticipate that mining activities, conducted under the casual use provisions of the California Desert Conservation Area Plan, are likely to cause substantial effects to the reproduction, numbers, and distribution of the desert tortoise within the action areas.

Activities associated with mining plans of operation could result in the loss of desert tortoises. As one would expect, larger mines are more likely to kill or injure more desert tortoises because

of their size, the greater number of large vehicles that would be in use, and the greater number of employees. The size of the area to be mined under a plan of operation can vary greatly, from the rather small decorative rock mines that are fairly common in the vicinity of Barstow to large open pit mines, such as the Yellow Aster Mine near Randsburg. The development of geothermal, oil, gas, or mineral resources within occupied habitat could result in substantial mortality of desert tortoises because of the generally large scale of the associated facilities. Vehicles accessing mines or other facilities along unpaved roads through desert tortoise habitat are also potential sources of mortality; the level of mortality would vary according to the length of the road, the level of use, and the density of desert tortoises in the area that it traverses.

Mineral development may have indirect effects on desert tortoises. Preliminary work indicates that desert tortoises near hard rock mines may contain elevated levels of metals (Chaffee and Berry 1999). We do not understand the full implications of this research to date or the pathway by which the metals entered the desert tortoise. Desert tortoises could have inhaled the metals as dust that was carried by wind from the mine site; they could also consume dust that had settled on plants or the ground when they eat or mine soil. Alternatively, substrate and plants may normally contain higher levels of these metals because they are located in heavily mineralized areas. If the metals are emanating from mines and are found to affect desert tortoises negatively, the impacts of specific mines would need to be revisited. If mines or other sites maintain ponds as part of the processing facility that desert tortoises can access, animals may die from drinking contaminated water or drown if the sides are too steep. Common ravens may be attracted to waters and other subsidies offered by mines or energy developments.

To date, large-scale development of mineral resources has generally been relatively limited in the Western Mojave Recovery Unit, although substantial overlap exists between occupied habitat of the desert tortoise and areas that contain geological resources (see maps, 12, 13, and 14 in Bureau 1999). Some mines (e.g., Yellow Aster) are located at higher elevations where desert tortoises are less abundant; however, the access roads to these mines may cross areas where desert tortoises are common. Fewer mines are located on bajadas and in the valleys where desert tortoises are more abundant; desert tortoises are generally more abundant within the actual mine site in these areas. The Hector Mine, which lies north of the Marine Corps Air Ground Combat Center, is such a facility. Numerous factors are involved in determining whether large mines can be developed, including the presence of minerals of sufficient quality and quantity and the ability of operators to consolidate a sufficient number of claims. Consequently, to date, the large-scale development of mineral resources has not caused a substantial amount of direct mortality of desert tortoises in the Western Mojave Recovery Unit.

To date, large-scale development of energy from geological resources has generally been limited in the Western Mojave Recovery Unit. In this planning area, geothermal development has been limited to the Coso region at the Naval Air Weapons Station, China Lake; the U.S. Navy manages this area. In general, high potential for geothermal resources does not occur in areas occupied by the desert tortoise (see map 15 in Bureau 1999). Consequently, the likelihood of geothermal development in areas occupied by the desert tortoise in the Western Mojave Recovery Unit seems to be low.

To the best of our knowledge, development of oil and gas resources in the California Desert Conservation Area has not been proposed since the listing of the desert tortoise in 1990. Based on the lack of this activity in the last 15 years, the development of oil and gas resources in the Western Mojave Recovery Unit is unlikely to occur in areas occupied by the desert tortoise in the foreseeable future.

Numerous small mines that produce decorative rock and sand and gravel have been developed; we anticipate that these facilities will continue to be developed under the guidelines for plans of operation contained in the West Mojave Plan and the California Desert Conservation Area Plan. Because of the location of these mines in rockier areas and their small size, few desert tortoises are likely to be killed or injured as a result of this type of mining activity. For those reasons, we do not anticipate substantial impacts to the reproduction, numbers, or distribution of the desert tortoise with respect to plans of operation within the Western Mojave Recovery Unit.

The California Desert Conservation Area Plan, and therefore the West Mojave Plan, incorporates the Bureau's guidelines and regulations that implement mining laws relative to the approval of mining activities. The Bureau may refuse to approve a plan of operations until the plan meets its mitigation and compensation requirements. The mitigation required by the Bureau could reduce the level of the adverse effects of a mining operation by requiring operators to implement measures to reduce the level of mortality of desert tortoises.

The mining laws and regulations incorporated into the California Desert Conservation Area Plan require avoidance of unnecessary and undue degradation of public lands and reclamation of disturbed areas. If the Service found that a proposed plan of operations developed under the guidelines for this element in the California Desert Conservation Area Plan was likely to jeopardize the continued existence of the desert tortoise, the Bureau, with the authorities at 43 *Code of Federal Regulations* 3809.411(d)(3)(iii), "may disapprove of or withhold a plan of operations if the proposed operations 'would result in unnecessary or undue degradation of public lands'" (Bureau 2002a). Unnecessary or undue degradation is defined as "conditions, activities, or practices that, among other things, 'fail to comply with ... other Federal or State laws related to environmental protection..." (Bureau 2002a). The Bureau also noted that a biological opinion from the Service concluding that a plan of operations would likely jeopardize the continued existence of a species "would certainly indicate a failure to comply with the standards of the Endangered Species Act, and would, therefore, constitute unnecessary and undue degradation (Bureau 2002a)."

This aspect of the California Desert Conservation Area Plan ensures that large-scale mines will not be developed in a manner that would likely jeopardize the continued existence of the desert tortoise. We are unable to provide an estimate of the level of mortality of desert tortoises that mining activities may cause. We would be better able to provide such estimates during site- and project-specific reviews, conducted under the authorities of section 7(a)(2) of the Act.

Native Plant Harvesting. The harvesting of native plants will not be allowed within habitat conservation areas. This prohibition should reduce, by a very small degree, the amount of use of desert wildlife management areas; consequently, this action may benefit the desert tortoise.

Outside of the habitat conservation areas, plant harvesting will be regulated in accordance with the California Desert Native Plant Protection Act. The level of this type of use in the planning area is likely low; consequently, we expect that few desert tortoises are likely to be killed by the harvesting of native plants.

The Bureau will consider whether to authorize individual actions when they are proposed by applicants. Consequently, it will consult with the Service, under the auspices of section 7(a)(2) of the Act, as appropriate if a specific action is proposed.

Recreation. The prohibition of vehicle speed events within the desert wildlife management areas and the Mohave Ground Squirrel Conservation Area will reduce the threat that vehicles will strike desert tortoises. Permitting dual sport events from November 1 to March 1 in desert wildlife management areas, including the Rand Mountains, poses a low level of risk to desert tortoises because they are less active during this portion of the year. The Bureau's proposals to supplement education materials to indicate that young desert tortoises may be encountered during the fall and winter and should be avoided is likely to provide little benefit. Biologists who are experienced in conducting surveys for desert tortoises have difficulty detecting small individuals; riders of motorcycles and all-terrain vehicles will certainly be even less likely to be able to see and avoid such small individuals. Despite this fact, the risk to desert tortoises of these seasonal events is likely low because, although desert tortoises may be active at any time of the year, they usually do not wander far from their burrows during the shorter and cooler days from November 1 to March 1.

Allowing dual sport events in those portions of the Mohave Ground Squirrel Conservation Area outside of the desert wildlife management area only from September through February will benefit desert tortoises because events will not occur when they are most active. This beneficial effect will be minor because desert tortoises are not common in most of these areas. Conversely, some potential exists that desert tortoises could be killed during these events, although this likelihood is low.

The Bureau will consider whether to authorize individual speed and dual sport events when they are proposed by applicants. Consequently, it will consult with the Service, under the auspices of section 7(a)(2) of the Act, as appropriate when a specific action is proposed.

Minimum impact recreation (e.g., hiking, equestrian uses, bird watching, photography, etc.) would be allowed within the conservation areas. The degree of threat posed to desert tortoises by recreation increases with the speed, weight, and numbers of recreational units. Consequently, although these activities may lead to some level of mortality of desert tortoises, we expect few animals will be killed because of the dispersed nature and low intensity of this use. Recreational use of the California desert may benefit desert tortoises to some degree if users gain an appreciation for the land and its wildlife and undertake actions to conserve this resource. We will not conduct any further evaluation of the potential effects on the desert tortoise of causal use with regard to recreation in this biological opinion because its fundamental authorization occurs under the auspices of the California Desert Conservation Area Plan.

Wildlife Water Sources. The Bureau's proposal to allow existing artificial water sources (guzzlers, drinkers, tanks) to remain in place could pose some level of risk to desert tortoises. Desert tortoises have, in the past, drowned or been trapped in certain types of watering devices, when the slope of the device to the water's surface was steep and slippery with algae; Hoover (1988 in Boarman 2002) found 26 carcasses in 89 watering devices for upland game in California.

Enhancing the water supply for wildlife has the potential to increase the density of predators, which may result in increased predation on desert tortoises. In general, we have not observed any effects on populations of desert tortoises that can be attributed to increases in the numbers of individuals of native species caused by human-augmented sources of water. The common raven provides an exception to this statement. Common ravens are known to use numerous types of water sources; such subsidies likely increase their distribution and abundance in the Western Mojave Recovery Unit. We have no information on whether the presence of artificial waters substantially increases the range or reproductive capabilities of the common raven beyond those afforded by other sources of water. Knight et al. (1999) have demonstrated that common ravens are found more often at stock tanks than at natural springs and in the open desert, but similar data do not exist for guzzlers.

Desert tortoises may be struck by vehicles being used to gain access to existing waters for maintenance. We expect the level of mortality associated with the maintenance of existing waters to be low because the amount of maintenance work likely to be needed should be fairly minor.

We cannot predict how many desert tortoises would be killed or injured by the operation and maintenance of artificial waters. Even at the time of a project-specific review, we would be unable to predict the level of mortality of desert tortoises in artificial waters because we cannot assess when animals would encounter the waters and the precise circumstances under which they may become trapped; however, appropriately designed waters are unlikely to entrap many desert tortoises. The Bureau has proposed to modify guzzlers that are found to entrap desert tortoises; such an action would reduce the number of animals that are likely to be killed in these artificial waters.

Commercial Activities. Commercial activities within desert wildlife management areas may result in injury or mortality of desert tortoises, although the protective measures imposed by the Bureau should reduce the number of animals that are killed. The Bureau's proposal to direct proponents to lands outside desert wildlife management areas and to lower density areas within desert wildlife management areas, when possible, should assist in reducing effects to desert tortoises. The number of desert tortoises that would be killed or injured by any commercial activity can only be estimated based on a site-specific project review, which is beyond the scope of the proposed action; such reviews will be the subject of future consultations under section 7(a)(2) of the Act, as appropriate.

Domestic Dogs. Allowing dogs off leash if they are accompanied by and under the control of their owners poses a low level of risk to desert tortoises because such animals would be unlikely

to find and injure wildlife. Dogs in this situation may startle or disturb desert tortoises; in this case, the desert tortoise is likely to respond to the dog as it would to a coyote. Because we do not expect desert tortoises to be disturbed to the degree that they would be unable to feed, seek shelter, or engage in other necessary behavior, this level of disturbance is unlikely to impair their survival. Off-leash dogs in some situations (e.g., construction sites in desert wildlife management areas) may be left alone to a greater degree and hence have more opportunity to disturb or injure desert tortoises; therefore, prohibiting them in such situations, as proposed by the Bureau, is protective of desert tortoises. This provision of the West Mojave Plan would be in effect with the signing of the record of decision; consequently, it is a casual use that will not receive future action-specific consultation.

Shooting. The shooting or discharge of firearms, in accordance with State and local laws, on most public lands and during hunting season in pursuit of game and target practice using retrievable targets within desert wildlife management areas is unlikely to kill desert tortoises. If the use of firearms is legitimate, desert tortoises are unlikely to be struck by stray bullets, simply because of the low probability of hitting such a small target inadvertently. As we stated previously in this biological opinion, legitimate uses of the desert can facilitate unauthorized abuse. Berry (1986a in Boarman 2002) found that 20.7 percent of the desert tortoise carcasses showing evidence of being shot were from the western Mojave Desert; this statistic is more striking when compared with rates of 1.5 and 2.0 percent from the eastern Mojave and Colorado Deserts, respectively. In all, Berry examined 91 carcasses that showed evidence of being shot.

We expect that the enforcement of State regulations and county ordinances will be minimal, simply because protecting desert tortoises is not a high priority for law enforcement agencies of the State of California (with the obvious exception of the California Department of Fish and Game) and local agencies; additionally, these agencies are generally understaffed. We cannot predict how many desert tortoises may be killed by the unauthorized use of firearms; for the reasons cited in the previous paragraph, we do not expect desert tortoises to be shot during the legitimate discharge of firearms. This provision of the West Mojave Plan would be in effect with the signing of the record of decision; consequently, it is a casual use that will not receive future action-specific consultation.

Predation by Common Ravens. Implementation of a management program for the common raven has the potential to promote the conservation of the desert tortoise. If the program is successful in reducing the number of desert tortoises that are killed by common ravens, it will increase reproductive success, which is a key need for recovery of the desert tortoise. Workers implementing the program may kill or injure desert tortoises as they travel through the desert both on foot and in vehicles, but these effects are likely to be very minimal and involve few desert tortoises. Any program to kill individual common ravens will need additional permitting because of the Migratory Bird Treaty Act; the lead agency for implementing the program will also need to consider whether the desert tortoise (or its critical habitat) may be affected. Because any program to manage common ravens will require a substantial amount of future development, review, and approval by the Bureau and other agencies (including the Service), we will not discuss this issue further in this biological opinion.

Effects on the Critical Habitat of the Desert Tortoise

The recovery plan recommends that each desert wildlife management area be at least 1,000 square miles in area and that more than one desert wildlife management area be included within each recovery unit. The following table depicts the sizes of the critical habitat units and desert wildlife management areas in the Western Mojave Recovery Unit.

	Critical Habitat Unit ¹		Desert Wildlife Management Area ¹	
	Acres	(Square Miles)	Acres	(Square Miles)
Fremont-Kramer	518,000	(809)	494,720	(773)
Superior-Cronese	766,900	(1,198)	616,320	(963)
Ord-Rodman	253,200	(396)	248,320	(388)
Pinto Mountain	171,700	(268)	117,120	(183)

¹ Acreages for desert wildlife management areas are based on information in Table 4-6 of the final environmental impact report and statement. Acreages for critical habitat units are based on information in the final rule designating critical habitat for the desert tortoise (59 *Federal Register* 5820).

On-the-ground circumstances, however, dictate what any single agency with jurisdiction over desert wildlife management areas can accomplish. Although the Bureau has included virtually all public lands within the critical habitat units in its desert wildlife management areas, all four desert wildlife management areas are smaller than the size recommended in the recovery plan. The Bureau omitted some small parcels of critical habitat from desert wildlife management areas because they were completely surrounded by large blocks of private land and difficult to manage. In fact, approximately 18,460 acres of Bureau land within the boundaries of the critical habitat units were not included in the four desert wildlife management areas (Service 2005d).

Specifically, 9,678 acres of the Ord-Rodman Critical Habitat Unit were not included within a desert wildlife management area; these lands lie within the northern portion of the Johnson Valley Off-highway Vehicle Management Area. In this situation, the Service used section lines to draw the boundaries of the critical habitat unit; however, the Bureau had previously established the boundary of the off-highway vehicle management area along an unpaved road, which provides a much more well-defined boundary than section lines. The 9,678 acres are located in numerous parcels along approximately 16 miles of the boundary. The primary constituent elements on at least some of these parcels, particularly along the western portion of the boundary, were degraded prior to the designation of critical habitat; along the eastern portion of the boundary, habitat is generally less disturbed because the level of off-road vehicle use is lower. Given the location of the critical habitat that was excluded from the desert wildlife management area (i.e., at its edge) and the degraded condition of the primary constituent elements in at least a portion of the unit, its exclusion from the desert wildlife management area will not affect the conservation role and function of the Ord-Rodman Critical Habitat Unit.

In the Fremont-Kramer Critical Habitat Unit, the Bureau did not include approximately 1,734 acres within the desert wildlife management area. In the northern portion of the desert wildlife

management area, the Bureau again used established roads as the boundary; in the southern portion of the critical habitat unit, the Bureau did not include two parcels that were separated from other public land by large blocks of private land and another parcel that is located within the El Mirage Off-highway Vehicle Management Area. Given the location of the critical habitat that was excluded from the desert wildlife management area (i.e., at its edge) and the degraded condition of the primary constituent elements in at least a portion of the unit, its exclusion from the desert wildlife management area will not affect the conservation role and function of the Fremont-Kramer Critical Habitat Unit. Note also that the Bureau's designation of a conservation area for the Mohave ground squirrel will extend the one percent limit on future ground disturbance to areas of critical habitat that are north of the Fremont-Kramer Desert Wildlife Management Area; see the Amendment 4, Designation of the Mohave Ground Squirrel Conservation Area - Effects on Critical Habitat section of this biological opinion for a discussion of measures regarding the Mohave ground squirrel.

The Bureau did not include approximately 3,853 acres of the Superior-Cronese Critical Habitat Unit within the Superior-Cronese Desert Wildlife Management Area. Generally, the Bureau excluded four parcels of public lands for the same reasons discussed in the previous two critical habitat units. As in those cases, the conservation role and function of the Superior-Cronese Critical Habitat Unit will not be compromised by the exclusion of these areas. Note also that the Bureau's designation of a conservation area for the Mohave ground squirrel will extend the one percent limit on future ground disturbance to areas of critical habitat that are north of the Superior-Cronese Desert Wildlife Management Area; see the Amendment 4, Designation of the Mohave Ground Squirrel Conservation Area - Effects on Critical Habitat section of this biological opinion for a discussion of measures regarding the Mohave ground squirrel.

Finally, in the Pinto Mountain Critical Habitat Unit, the Bureau did not include approximately 3,195 acres in two parcels in the northwestern and northeastern corners of the desert wildlife management area. The exclusion of these parcels, at the corners of the Pinto Mountain Desert Wildlife Management Area, will not affect the conservation role and function of the Pinto Mountain Critical Habitat Unit.

Limiting the amount of cumulative ground disturbance to one percent of the public lands in each of the desert wildlife management areas will likely ensure that proposed actions do not appreciably compromise the function and conservation role of critical habitat units in the western Mojave Desert planning area. Conversely, approximately 99 percent of the critical habitat within the desert wildlife management areas will remain undisturbed; this lack of disturbance will clearly promote the ability of the critical habitat unit to achieve its conservation role and function.

We note that the one percent limit is tied to the size of the desert wildlife management area but not to the critical habitat unit. For this reason and because we do not know where future actions may occur, we cannot, with absolute certainty, state that only one percent of the critical habitat unit will be affected. We expect, however, that project impacts within the portions of the Superior-Cronese, Fremont-Kramer, Ord-Rodman, and Pinto Mountain critical habitat units managed by the Bureau will not exceed the one percent limit for several reasons. First, given the

past history of this area, most actions will be relatively small in scale and will be spread across the critical habitat unit. Second, the large degree of overlap between the desert wildlife management areas and critical habitat should ensure that many actions would not be concentrated within critical habitat but outside of the desert wildlife management areas. Finally, at least some projects will likely occur within the desert wildlife management area but outside of critical habitat. Consequently, we conclude that the one percent limit on cumulative ground disturbance within desert wildlife management areas is also likely to confer a high degree of protection to critical habitat.

Although the primary constituent elements of critical habitat may be disturbed or lost within areas of disturbance, the relatively small amount of disturbance (in relation to the size of the critical habitat) that the Bureau will permit should ensure that desert tortoises will continue to have sufficient area in which to feed, breed, and find shelter. Additionally, because the disturbance and loss of habitat would likely occur through the implementation of numerous actions, separated through the desert wildlife management area by distance and over time, we do not anticipate that habitat is likely to be fragmented to the extent that the function and conservation role of the critical habitat unit as a whole is compromised.

The Bureau requirement that project proponents compensate for loss or disturbance of desert tortoise habitat within desert wildlife management areas at a ratio of five acres of compensation for every acre loss or disturbed will promote the conservation of the desert tortoise by protecting more critical habitat of the desert tortoise. Once acquired, the provisions of section 7(a)(2) would be in force. The consultation mandate requires Federal agencies to avoid adverse modification of critical habitat of listed species.

Additionally, the Bureau can use funds generated in this manner to close roads, regulate activities, and attempt to restore the primary constituent elements of critical habitat on acquired parcels and ultimately reduce the level of threat and disturbance to critical habitat of the desert tortoise. Although the compensation requirement will generally benefit the conservation role and function of critical habitat, the limit on loss or disturbance of habitat within desert wildlife management areas and the general lack of activity in the planning area may result in the acquisition of a fairly small amount of habitat through this means; one exception to this general rule may be compensation acquired for large utility projects.

Mining Exploration Access. Foot traffic of operators or equipment during exploration may disturb habitat and subsequently lead to an invasion of non-native plants. Under most mining activities that could be conducted under the casual use provisions, the primary constituent elements of critical habitat could be removed from a small area; the impacts of casual use on the maintenance of sufficient space to support viable populations of desert tortoises within the western Mojave Desert and to provide for their movement, dispersal, and gene flow, are likely to be minor, given that, by definition, these activities are minor in size and intensity.

The guidelines require that disturbances created during casual use be restored. Restoration attempts often fail in the harsh climate of the desert. However, because the disturbance allowed under casual use is minimal, the required restoration may be attainable. A possible exception

would be invasion by non-native plants, in part, because this effect would likely not be seen for months after the casual use and restoration occurred.

Without off-road vehicle use, the amount and size of other equipment that may be employed during casual use is likely to be limited. For this reason, the amount of disturbance to critical habitat of the desert tortoise that may occur as a result of casual use under the mining guidance of the California Desert Conservation Area Plan is likely to be limited and fairly close to authorized routes of travel.

As we noted in the previous section, the level of casual use is likely to be fairly common in areas that may have potential to contain geothermal, oil, gas, or mineral resources. Such areas have a substantial degree of overlap with critical habitat of the desert tortoise.

Because casual use generally has minor effects on relatively small areas and these activities are likely to be scattered over large areas, it would be highly unlikely to affect the primary constituent elements of critical habitat of the desert tortoise in a manner or at a scale that would compromise the function and conservation role of any critical habitat unit. Note that casual use may occur in any area that is open to mineral entry without specific approval by the Bureau; therefore, site-specific consultation will not occur on casual use activities. Note also that we will not conduct any further evaluation of the potential effects on critical habitat of casual use with regard to mining in this biological opinion because its fundamental authorization occurs under the auspices of the California Desert Conservation Area Plan.

Activities associated with mining plans of operation could result in the temporary or permanent loss of desert tortoise habitat and the introduction or spread of non-native plant species. Under most mining activities that would require a plan of operations, the mining may locally remove or seriously degrade most of the primary constituent elements of critical habitat. The impacts of a mining action on the first primary constituent element, the maintenance of sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow, could only be evaluated on a site- and project-specific basis.

Under the authority and guidelines of the California Desert Conservation Area Plan, the Bureau will require restoration of lands disturbed during mining activities conducted under plans of operations. However, restoration efforts may not be successful in re-establishing the same quality and type of habitat that existed prior to the mining activity. Large areas are more difficult to restore; however, large mining companies have devoted extensive funding and resources to at least some restoration efforts (e.g., Viceroy Mine in the eastern Mojave Desert near Lanfair Valley). To date and to the best of our knowledge, desert tortoises have not used large mines that have been reclaimed from past mining activities.

Preliminary work indicates that desert tortoises near hard rock mines may contain elevated levels of metals. As we discussed in the previous section, we do not understand the full implications of this research to date or the pathway by which the metals entered the desert tortoise. If the metals are emanating from mines and are found to compromise the primary constituent elements of

critical habitat of the desert tortoise in a substantial negative manner, the impacts of specific mines would need to be revisited.

To date, large-scale development of mineral resources has generally been relatively limited in the California Desert Conservation Area, although substantial overlap exists between critical habitat of the desert tortoise and areas that contain geological resources (see maps, 12, 13, and 14 in Bureau 1999). Some mines (e.g., Yellow Aster) are located at higher elevations that do not support the primary constituent elements of critical habitat. The access roads to these mines may cross areas where the primary constituent elements are present. Fewer mines are located on bajadas and in the valleys where the primary constituent elements are usually present. The Hector Mine, which lies north of the Marine Corps Air Ground Combat Center, is such a facility. Numerous factors are involved in whether a large mine can be developed; the presence of minerals of sufficient quality and in sufficient quantity and the ability of operators to consolidate a sufficient number of claims are pertinent factors. Consequently, to date, the large-scale development of mineral resources in the California Desert Conservation Area has not caused the removal of substantial amounts of critical habitat that support primary constituent elements.

To date, large-scale development of energy from geological resources has generally been limited in the Western Mojave Recovery Unit. Geothermal development has been limited to the Coso region at the Naval Air Weapons Station, China Lake; this area is outside the boundaries of critical habitat of the desert tortoise. In general, high potential for geothermal resources does not occur within critical habitat of the desert tortoise (see map 15 in Bureau 1999). Consequently, the likelihood of geothermal development within critical habitat of the desert tortoise in the Western Mojave Recovery Unit seems to be low.

To the best of our knowledge, development of oil and gas resources in the California Desert Conservation Area has not been proposed since the listing of the desert tortoise in 1990. Based on the lack of this activity in the last 15 years, the development of oil and gas resources in the Western Mojave Recovery Unit is unlikely to occur in areas that support the primary constituent elements of critical habitat of the desert tortoise in the foreseeable future.

Numerous small mines that produce decorative rock and sand and gravel have been developed; we anticipate that these facilities will continue to be developed under the guidelines for plans of operation contained in the California Desert Conservation Area Plan. Because of the location of these mines in rockier areas and their small size, we anticipate that they will cause localized and minor effects to the primary constituent elements of critical habitat of the desert tortoise.

The California Desert Conservation Area Plan incorporates the Bureau's guidelines and regulations that implement mining laws relative to the approval of mining activities. The Bureau may refuse to approve a plan of operations until the plan meets its mitigation and compensation requirements. The mitigation required by the Bureau could reduce the level of the adverse effects of a mining operation to the primary constituent elements of desert tortoise critical habitat.

The mining laws and regulations incorporated into the California Desert Conservation Area Plan require avoidance of unnecessary and undue degradation of public lands and reclamation of disturbed areas. If the Service found that a proposed plan of operations developed under the guidelines for this element in the California Desert Conservation Area Plan was likely to jeopardize the continued existence of the desert tortoise, the Bureau, with the authorities at 43 *Code of Federal Regulations* 3809.411(d)(3)(iii), “may disapprove of or withhold a plan of operations if the proposed operations ‘would result in unnecessary or undue degradation of public lands’” (Bureau 2002a). Unnecessary or undue degradation is defined as “conditions, activities, or practices that, among other things, ‘fail to comply with ... other Federal or State laws related to environmental protection...’” (Bureau 2002a). The Bureau also noted that a biological opinion from the Service concluding that a plan of operations would likely jeopardize the continued existence of a species “would certainly indicate a failure to comply with the standards of the Endangered Species Act, and would, therefore, constitute unnecessary and undue degradation (Bureau 2002a).” Adverse modification of critical habitat would also constitute unnecessary and undue degradation because it would violate section 7(a)(2) of the Act (Lorentzen pers. comm. 2005a).

In summary, the Bureau’s unnecessary and undue degradation standard provides assurance that mining activity is unlikely to cause the permanent loss or temporary disturbance of large amounts of critical habitat. The unnecessary and undue degradation standard and the low likelihood that large-scale mines would be developed in numerous locations throughout the desert should ensure that the program direction for mining activities does not diminish appreciably the function and conservation role of critical habitat of desert tortoise. We are unable to provide any estimate of the amount of critical habitat of the desert tortoise that mining activities may disturb or remove. We would be better able to provide such estimates during site- and project-specific reviews.

Native Plant Harvesting. Because of the large degree of overlap between critical habitat units and desert wildlife management areas, the prohibition against harvesting of native plants within habitat conservation areas will protect the primary constituent elements regarding the maintenance of plants as forage and shelter for the desert tortoise; additionally, to the best of our knowledge, this activity occurs relatively infrequently. The relatively minor amount of harvesting of native plants that occurs outside of desert wildlife management areas is unlikely to reduce the suitability of habitat for the desert tortoise in these portions of the desert.

Recreation. The use of vehicles on roads that are designated as open or limited during recreational activities, such as dual sport events, will not, in general, adversely affect the primary constituent elements of critical habitat because these biological and physical attributes are not present within roadbeds. Some roads support annual plants, possibly even at greater local densities than on adjacent, undisturbed habitat, because of alterations in the hydrological regime caused by the road. Although such areas may be of value to a few desert tortoises, they are not so extensive that they substantially alter the patterns of the distribution of forage plants.

The degree of threat posed to critical habitat by recreation increases with the speed, weight, and numbers of recreational units. For example, a small group of hikers poses much less threat to the

primary constituent elements of critical habitat than a race involving numerous all-terrain vehicles. Additionally, most minimum impact recreation likely occurs relatively close to roads so the impact away from roaded areas is even less intense. Consequently, the minimum impact recreation that the Bureau proposes to allow within desert wildlife management areas are unlikely to disturb the primary constituent elements to the extent that the conservation role and function of the critical habitat units are compromised.

Wildlife Water Sources. The Bureau's proposal to leave existing springs, seeps, and artificial water sources (e.g., guzzlers, drinkers, tanks) in place will not have a substantial effect on the primary constituent elements of critical habitat. Natural springs and seeps do not support the primary constituent elements of critical habitat of the desert tortoise; the plant communities and substrates at springs are generally more characteristic of wetland habitats, which are not primary constituent elements of critical habitat of the desert tortoise. We recognize that leaving artificial water sources, such as facilities to water cattle, would likely maintain the level of disturbance that is common around such features; we will address that issue in the section of this biological opinion on livestock grazing. Finally, the maintenance of existing guzzlers would have an insignificant effect on the primary constituent elements of critical habitat because any disturbance associated with such activities will be limited to the immediate area of the facility; vehicle access to guzzlers would be via existing designated routes.

Commercial Activities. Commercial activities within critical habitat units may result in disturbance or loss of primary constituent elements. The Bureau's proposal to direct proponents to lands outside desert wildlife management areas and, therefore, to a large degree outside of critical habitat, when possible, should assist in reducing effects to the primary constituent elements. The precise amount of critical habitat that would be disturbed or lost as a result of any commercial activity can only be determined on a site-specific project review, which is beyond the scope of the proposed action; such reviews will be the subject of future consultations under section 7(a)(2) of the Act, as appropriate. The Bureau's proposals to direct commercial activities to areas outside of desert wildlife management areas (and, therefore, outside of critical habitat) and the fact that any disturbance of land with desert wildlife management areas will be subject to the one percent limit on new ground disturbance leads us to conclude that commercial activities are unlikely to compromise the conservation role and function of critical habitat units in the Western Mojave Recovery Unit.

Domestic Dogs. Dogs that are accompanied by and under the control of their owners may adversely affect the primary constituent elements of critical habitat by trampling annual plants, damaging shrubs, and digging. Because these impacts would likely occur on a very limited scale, in relation to the size of the critical habitat units, we conclude that allowing domestic dogs within desert wildlife management areas is unlikely to compromise the conservation role and function of critical habitat units in the Western Mojave Recovery Unit. We will not conduct any further evaluation of the potential effects on critical habitat of domestic dogs in this biological opinion because their presence in the California Desert Conservation Area is authorized under the auspices of the California Desert Conservation Area Plan.

Shooting. Allowing the use of firearms for target practice may result in some level of damage to the primary constituent elements of critical habitat of the desert tortoise. Persons involved in legitimate hunting and target shooting could potentially damage the quality of the primary constituent elements of critical habitat by introducing lead to substrates that desert tortoises mine for minerals. We do not have information on the effects of lead on desert tortoises, but we expect that the areas in which lead could be ingested in this manner would be fairly localized within the extensive areas available for target shooting. At least some portions of the public will likely shoot at shrubs to the extent that they are damaged and may no longer provide shelter for desert tortoises. Although we cannot predict the extent of damage to the primary constituent elements of tortoise critical habitat that may result from the use of firearms, given the size of the critical habitat units, we expect that most detectable impacts will be very localized and that only negligible adverse effects are likely to occur to the primary constituent elements and function of the critical habitat units in the Western Mojave Recovery Unit.

Amendment 3, Changes in Multiple-use Class Designations

The Bureau has proposed to change the land use designations within numerous areas of critical environmental concern and other areas in the planning area.

Effects on the Desert Tortoise

Changing the multiple-use class designations from M to L on certain lands within the expanded Afton Canyon Area of Critical Environmental Concern will, as we noted in our previous discussion regarding this area of critical environmental concern, provide a conservation benefit to the desert tortoise. The Bureau's decision to change the multiple-use class designations from Class M to Class L on 9,809 acres in the northern Lucerne Valley within the Bendire's Thrasher Area of Critical Environmental Concern, from M to L on 14,224 acres of the Pisgah Area of Critical Environmental Concern, from Class M to Class L on 9,809 on 4,393 acres on the north slope of the San Bernardino Mountains within the Carbonate Endemics Plants Area of Critical Environmental Concern, from unclassified to Class L on the 628-acre Mojave Fishhook Cactus Area of Critical Environmental Concern south of Helendale, and from unclassified and Class I to Class L on 10,633 acres in Brisbane Valley within the Mojave Monkeyflower Area of Critical Environmental Concern will also benefit the desert tortoise. These actions will benefit desert tortoises because designation of the areas as Class L limits, to a certain degree, the amount of development activity that may occur. We recognize that all development is not prohibited on Class L lands. Our previous biological opinion on the California Desert Conservation Area Plan evaluated the program direction provided by the Bureau's land use classification; we will not repeat that analysis herein.

The Bureau will also change the multiple-use class designations from Class I to Class L on 5,391 acres to the east of Searles Dry Lake. This change, which is being made primarily for the conservation of the Mohave ground squirrel, will occur in areas where desert tortoises exist in low numbers; consequently, desert tortoises may benefit from the change to some degree.

Changing the land use designation from unclassified to Class M on 1,922 acres adjacent to Joshua Tree National Park to protect the Little San Bernardino Mountains gilia is also protective of the desert tortoise. The management guidance provided under Class M is more protective than for unclassified lands. Additionally, this land use designation would allow the Bureau to transfer these lands to another entity that may be able to manage this small, isolated parcel more efficiently than the Bureau.

The benefits to the desert tortoise described in the previous three paragraphs are not likely to be substantial because, with the exceptions of the Mojave Monkeyflower and Pisgah areas of critical environmental concern, relatively few desert tortoises likely occur in these areas. Nevertheless, conserving desert tortoises in these areas is important because it allows them to persist in a greater variety of habitat types and possibly for maintaining some degree of genetic diversity. The conservation of desert tortoises in the Pisgah Area of Critical Environmental Concern area is particularly important because of their use of extensive areas of lava flows; the conservation of this use of an atypical habitat is an important component of protecting the full suite of ecosystems upon which the desert tortoise depends.

The change in multiple-use class designations from Class M and L to unclassified on 6,828 acres in southern Inyo County will likely have a minor negative effect on the desert tortoise. Once designated as unclassified, the Bureau may dispose of these lands; subsequently, they may be developed. These areas, which lie outside of any desert wildlife management areas and critical habitat for the desert tortoise, are located at the northern edge of the desert tortoise's range in this portion of the desert. Additionally, approximately half of these lands are outside the range of the desert tortoise, as it was defined in 2002 (see Map 3-10 in the final environmental impact report and statement). Consequently, the number of animals in these areas is generally very low, if any occur there at all. An additional ameliorating effect is that the parcels selected for disposal are located immediately adjacent to Highways 395 and 178; the density of desert tortoises near busy roads is generally lower than in surrounding areas farther from the roads.

The Bureau also proposes to adjust the zoning within the West Mojave Land Tenure Adjustment Program and change the multiple-use class designations to reflect the new land tenure. The Bureau would remove lands from the disposal zone and place them into retention or consolidation zones; it would also change the multiple-use class designations from unclassified to Class L in these areas. These changes will result in approximately 21,902 additional acres being managed for the conservation of the desert tortoise. The principle areas where boundaries will be modified in this manner are south of Edwards Air Force Base, along the southern borders of the Fremont-Kramer and Superior-Cronese desert wildlife management areas, and in the area south of Highway 58 east of Helendale Road.

As we noted previously in this biological opinion, the Bureau was required to re-initiate formal consultation on the West Mojave Land Tenure Adjustment Program if the Department of the Army completed its expansion proposal for Fort Irwin; the Bureau had delayed land exchange activities within the eastern 200 square miles of the project area until the status of these lands was determined (Service 1990). In the initial consultation, the Bureau anticipated that the ratio of private lands acquired to public lands disposed would be approximately 2.4 to 1. Because of

the expansion of Fort Irwin into large areas of public land (and a smaller area of private lands), the Army's acquisition of approximately 99,000 acres of private land to compensate for the expansion, and the fact that owners of large areas of private land are limited within the areas covered by the proposed desert wildlife management areas, the Bureau may no longer be able to maintain a ratio of 2.4 to 1. Despite the likelihood that the Bureau may not be able to maintain this ratio and that some desert tortoises may reside on lands that the Bureau may offer for exchange, we consider the overall effect of the West Mojave Land Tenure Adjustment Program and the changes proposed in this amendment on the species to be positive because, although the Bureau will no longer be able to exchange these lands for others of high conservation value, their retention expands the area within which desert tortoises can be managed. We have not conducted a quantitative analysis of the changes; however, the addition of these lands to the retention zone seems to decrease the ratio of the boundary length to the area of the desert wildlife management areas. As the recovery plan notes, smaller boundary length to area ratios provide a better design for reserves because the indirect effects of activities outside of the conservation area cannot reach as far into the reserve. Additionally, the lands that the Bureau will offer for exchange are generally isolated from large blocks of public land or at the edges of urbanized areas; in general, their management for conservation would require relatively greater expenditures of the Bureau's resources in relation to the conservation value. Finally, these areas support few desert tortoises. The Bureau will continue to notify the new owners of the requirements of the Endangered Species Act. In the event that the entities acquiring these parcels intended to engage in activities that may kill or injure desert tortoises, they should contact the Service to determine how best to comply with the Endangered Species Act.

The Bureau, in the final environmental impact report and statement, notes that 4,839 acres of non-wilderness Class C lands would undergo changes in multiple-use class to Class L, M, or I. In general, the lands would be re-assigned to multiple-use classes that are more appropriate for the uses on surrounding lands. Lands that would be reclassified and either support or may support desert tortoises occur near four wilderness areas and constitute a small portion of the desert wildlife management area system in the Western Mojave Recovery Unit. Additionally, most of the parcels would remain within a desert wildlife management area and be protected by the one percent limit on allowable ground disturbance. Consequently, although these changes may reduce the level of protection afforded to the desert tortoise on these lands to some degree, any adverse effect of the reclassifications would be minor.

We discussed the issues surrounding the Western Rand Area of Critical Environmental Concern in the previous section of this biological opinion and will not repeat them here. We note that, the change of the multiple-use class designation from Class M to Class L on 13,120 acres would benefit the conservation of the desert tortoise for the reasons discussed previously in this section of the biological opinion.

The actions discussed in the preceding paragraphs will be authorized under the California Desert Conservation Area Plan and would become effective upon the Bureau's signing of the record of decision. Consequently, the Bureau and Service will not consult on these issues again, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16.

Effects on Critical Habitat of the Desert Tortoise

Public lands within the boundaries of the Western Mojave Land Tenure Adjustment program that were formerly identified for disposal lie within the boundaries of critical habitat. The Bureau's proposal to retain these lands and manage them under the guidelines of Class L will promote the conservation role and function of critical habitat because, as we have stated previously in this biological opinion, the Class L guidelines provide a greater emphasis on the conservation of natural resources than other land use classes (with the exception of Class C) and the one percent limit on surface disturbance associated with desert wildlife management areas and habitat conservation areas will apply.

Amendment 4, Designation of the Mohave Ground Squirrel Conservation Area.

The Bureau will establish conservation areas for the Mohave ground squirrel that cover 1,308,877 acres to the west, northwest, and north of the Fremont-Kramer Desert Wildlife Management Area.

Effects on the Desert Tortoise

The establishment of the conservation area for the Mohave ground squirrel is likely to promote the conservation of the desert tortoise to some degree in areas that are outside of desert wildlife management areas because the one percent limit on future ground disturbance will also be in effect within this area. In particular, desert tortoises located to the north and west of the Fremont-Kramer Desert Wildlife Management Area will likely derive conservation benefit from this action because the protective measures of a conservation area will apply.

Effects on Critical Habitat of the Desert Tortoise

The establishment of the conservation area for the Mohave ground squirrel will extend the provisions of the one percent limit on future ground disturbance to areas that are outside of desert wildlife management areas. In particular, this measure will benefit the management of the parcels of critical habitat located to the north of the Fremont-Kramer Desert Wildlife Management Area and at the northwest corner of the Superior-Cronese Desert Wildlife Management Area. Approximately 847 acres of critical habitat will be included in the conservation area for the Mohave ground squirrel in the Fremont-Kramer Critical Habitat Unit; approximately 1,712 acres of critical habitat will be included in the conservation area for the Mohave ground squirrel in the Superior-Cronese Critical Habitat Unit (Service 2005d).

Amendment 5, Implementation of the Rand Mountain – Fremont Valley Management Plan.

The Bureau proposes to expand the Western Rand Area of Critical Environmental Concern by 13,120 acres, designate the lands in the expanded area of critical environmental concern as Class L, close the entire management area to off-highway vehicle use except for 129 miles of designated open routes, and categorize a portion of the Rand Mountains - Fremont Valley Management Area as Category I habitat for the desert tortoise. The Bureau will withdraw

32,590 acres within the Rand Mountains - Fremont Valley Management Area from mineral location and entry. The 6,090-acre Koehn Lake and an additional 8,320 acres would remain as Class I and open to mineral entry. The Bureau will require visitors to obtain a permit if they wish to use vehicles in the Rand Mountains.

The actions discussed in the preceding paragraph will be authorized under the California Desert Conservation Area Plan and would become effective upon the Bureau's signing of the record of decision. Consequently, the Bureau and Service will not consult on these issues again, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16. Note that, although the West Mojave Plan constitutes the Bureau's proposed action with regard to the Western Rand Area of Critical Environmental Concern, the decision to remove the closure can be made separately from the record of decision for the planning area as a whole. Consequently, the Bureau will remove the closure when it considers the management of vehicle use in this area to be in compliance with the established guidelines.

Effects on the Desert Tortoise

Implementation of the Rand Mountains – Fremont Valley Management Plan may substantially benefit the desert tortoise. Although recreationists have shown disregard for the 12,300-acre area that is currently closed, the Bureau has expended extensive effort to ensure that the benefits of implementing the management plan are realized.

As part of the settlement agreement with the Center for Biological Diversity, the Bureau has closed this area to vehicles since March 29, 2002. Despite this closure, a monitor hired by the Bureau to observe its effectiveness documented numerous instances of lack of compliance with the closure of the area. For example, from August 2002 to March 2003, the monitor documented 64 occasions of motorcyclists and occasionally truck drivers traveling cross-country, over restored areas, and parallel to existing routes; these observations were made at fixed monitoring points (McEwan undated). She also incidentally observed tracks on 129 occasions. The monitor observed tracks going around closure signs on 14 occasions. Motorcyclists and occasionally truck drivers have driven around the end of wing fences to enter the closure area. Multiple motorcycle tracks going around the end of the wing fences have been observed on 22 occasions. Motorcyclists have cut the fence to enter the closure area, particularly in the southwest corner of the closure where the terrain is rugged. The monitor observed 20 fence cuts during this period. On four occasions, drivers have backed trucks over the fence or knocked down gates. Motorcyclists and occasionally truck drivers have entered the closure from the unfenced area along Munsey Road and from private land on the north side. Motorcycle tracks were observed on 14 occasions and truck tracks were observed twice (McEwan undated).

Desert tortoises persist in this area (McEwan undated); however, their numbers have decreased dramatically. Vehicles driving cross-country pose a substantial risk to desert tortoises; if such events occur on a frequent basis, the number of desert tortoises may decrease to a point where a viable population is no longer present.

To address the issue of use of unauthorized routes, the Bureau has undertaken numerous remedial actions and proposed additional measures, through this plan amendment. Since March 2002, the Bureau has been undertaking an extensive program of monitoring and restoration work (attachments 1 and 2 from Bureau 2005c). Workers from the Student Conservation Association have closed 853 intrusions, installed 204 carsonite signs, restored approximately 23.6 miles of unauthorized trails, placed 445 straw bales, planted 650 live shrubs, and installed 75 drainage structures and 3.8 miles of fence (attachments 4 and 5 from Bureau 2005c). Maps prepared by the Bureau (attachment 6 from Bureau 2005c) depict the extensive network of unauthorized routes that the Bureau has made unavailable for use through this work. The Bureau estimates that at least 349 miles of unauthorized routes have been made unavailable for use through the work conducted by the Student Conservation Association (LaPre 2005q).

The Bureau's efforts to restore habitat and close unauthorized routes comprises an important component of managing vehicular use in the Rand Mountains. For example, the Bureau can more easily enforce its regulations with regard to unauthorized use if it has established a clear system of legal routes. The restoration of unauthorized routes, in large part, makes them more difficult to see; therefore, riders are far less likely to use them. In effect, the restoration work should establish an altered pattern of use in which riders restrict their activities to designated routes.

The Bureau's proposal to allow use of 129 miles of designated routes within the Rand Mountains - Fremont Valley Management Area is likely to result in injuries or mortalities to desert tortoises. As in most cases where dispersed use occurs, predicting the number of desert tortoises that could be killed or injured is not possible. We anticipate, however, that the potential for desert tortoises to be killed or injured will decrease because the extent of the route network will be substantially less than prior to the closure.

Requiring visitors to pay a fee and obtain a permit to use vehicles in the Rand Mountains may reduce the number of individuals who use the site for off-highway vehicle recreation; it may also increase the environmental awareness of riders who continue to use the area. In either case, the number of desert tortoises that may be struck by vehicles in the management area would likely decrease. The potential also exists that riders will transfer their recreational uses to other areas in the California Desert Conservation Area. We understand that a shift in use patterns occurred when the Bureau imposed an interim closure for part of the Imperial Sand Dunes Recreation Area in Imperial County. A shift in use may not be immediately detectable and may result in the establishment of new patterns of use before the Bureau recognizes them. If this situation occurs, the level of unauthorized off-road vehicle use may increase elsewhere in the California Desert Conservation Area, to the detriment of the desert tortoise.

The Bureau will withdraw 32,590 acres within the Rand Mountains - Fremont Valley Management Area from mineral location and entry. This action will benefit the desert tortoise by reducing the likelihood that desert tortoises will be killed or injured by new mining activities.

Retaining areas within the Koehn Lake and Randsburg areas as Class I and open to mineral entry is unlikely to have substantial direct effects on the desert tortoise because neither area supports

high quality habitat; previous disturbance, lake bed and lake-edge habitat conditions around Koehn Lake, and higher elevations around Randsburg are the likely reasons for the lower number of animals. We cannot assess, at this time, the specific effects of human use of these areas on the desert tortoise; we should be able to provide better estimates of the number of desert tortoises that may be affected during site- and project-specific reviews.

In summary, the implementation of the proposed management for the area comprising the Rand Mountains and Fremont Valley should reduce the adverse effects of vehicle use and other activities, such as mining, on desert tortoises. For this reason, this component of the proposed amendment to the California Desert Conservation Area Plan is not likely to reduce the reproduction, numbers, or distribution of the desert tortoise.

Effects on Critical Habitat of the Desert Tortoise

Implementation of the Rand Mountains – Fremont Valley Management Plan may promote the conservation role and function of critical habitat. The previous section documented the level of unauthorized use that occurred in the closed area in late 2002 and early 2003 and the remedial actions that the Bureau has undertaken since that time. The restoration work may not restore the primary constituent elements of critical habitat of the desert tortoise in and of itself. However, because the evidence of previous use has largely been removed, riders may be more likely to restrict themselves to designated routes; if areas outside of these routes are not continually disturbed by vehicle use, the potential exists that the primary constituent elements of critical habitat, such as appropriate substrates, forage plants, and scrubs may begin to attain pre-disturbance characteristics.

The Bureau's proposal to allow use of 129 miles of designated routes within the Rand Mountains - Fremont Valley Management Area is not likely to degrade the conservation role and function of critical habitat. These routes have been in use for years; consequently, the primary constituent elements of critical habitat have already been removed from the area within these designated routes and their continued use in an authorized manner will not degrade adjacent lands. More importantly, the vast majority of the area covered by the management plan remains available to support the primary constituent elements of critical habitat.

Requiring visitors to pay a fee and obtain a permit to use vehicles in the Rand Mountains may reduce the number of individuals who use the site for off-highway vehicle recreation; it may also increase the environmental awareness of riders who continue to use the area. In either case, the amount of unauthorized use in the management area would likely decrease; consequently, the condition of the primary constituent elements, particularly those related to the composition of the annual and perennial plant communities and nature of substrates, would likely improve. The potential also exists that riders will transfer their recreational uses to other areas in the California Desert Conservation Area. We understand that a shift in use patterns occurred when the Bureau imposed an interim closure for part of the Imperial Sand Dunes Recreation Area in Imperial County. A shift in use may not be immediately detectable and may result in the establishment of new patterns of use before the Bureau recognizes them. If this situation occurs, the level of

unauthorized off-road vehicle use may increase elsewhere in the California Desert Conservation Area, to the detriment of critical habitat of the desert tortoise.

The Bureau will withdraw 32,590 acres within the Rand Mountains - Fremont Valley Management Area from mineral location and entry. This action will reduce the likelihood that new mining activities will disturb the primary constituent elements of critical habitat; consequently, this action would support the conservation role and function of critical habitat of the desert tortoise.

In summary, the implementation of the proposed management for the area comprising the Rand Mountains and Fremont Valley should reduce the adverse effects of vehicle use and other activities, such as mining, on critical habitat of the desert tortoise. For this reason, this component of the proposed amendment to the California Desert Conservation Area Plan is not likely to compromise the conservation role and function of critical habitat.

Amendment 8, Adoption of Standards and Guidelines for Management of Grazing. The Bureau has proposed numerous modifications to the management prescriptions for livestock grazing. Our analysis first considers the effects of livestock grazing on the desert tortoise and its critical habitat. We then consider the likely effects on the desert tortoise and the primary constituent elements of its critical habitat of the general management prescriptions proposed by the Bureau in the West Mojave Plan. Finally, we evaluate the effects of the grazing program, as modified by the Bureau's prescriptions in the West Mojave Plan, on the desert tortoise and its critical habitat in the Western Mojave Recovery Unit.

Effects of the Livestock Grazing

Effects on the Desert Tortoise

Livestock grazing affects desert tortoises in several ways. Desert tortoises can be killed or injured during the construction, maintenance, and use of range improvements. Cattle have trampled desert tortoises. They also damage or destroy the burrows of desert tortoises. Predators, such as common ravens, can be attracted to and subsidized by livestock waters, carcasses of livestock, and some range improvements; predators attracted to or subsidized by these features could feed on desert tortoises.

The construction, maintenance, and use of range improvements would affect desert tortoises in a manner generally similar to other smaller projects. Vehicles and workers could trample desert tortoises during any phase of these operations. In comparison with a large-scale development such as a solar power plant, the construction, maintenance, and use of range improvements likely result in the injury and mortality of few desert tortoises.

Desert tortoises have been trampled by livestock both above ground or while they are in their burrows. Although documented instances exist of cattle crushing adult desert tortoises in their burrows, neonate and juvenile desert tortoises are likely at some greater risk of trampling because they use rodent burrows for shelter. Rodent burrows are often shallowly excavated and

run parallel to the surface of the ground; therefore, they are more vulnerable to trampling by livestock than burrows of sub-adult and adult desert tortoises. The propensity for rodents to place their burrows near and under shrubs may offer some degree of protection.

No data exist on the frequency at which cattle trample desert tortoises. Cattle likely pose a low degree of risk to adult desert tortoises and possibly sub-adults above ground, simply because cattle would likely try to avoid stepping on what essentially would appear to them to be a rock (Boarman 2002). Cattle would be more likely to trample desert tortoises when they are being herded; while traveling in groups and at a faster rate, cattle are less likely to be aware of their surroundings. Finally, an important concept to consider is that numerous cattle, distributed over large areas of desert tortoise habitat, present a greater likelihood of killing or injuring more desert tortoises than fewer cattle grazing over a smaller area; simply stated, fewer hooves in proximity to fewer desert tortoises are less likely to cause trampling.

Avery and Neibergs (1997) found that more burrows of desert tortoises were partially or completely destroyed in areas that were grazed by cattle than in a fenced area. Within the enclosure, desert tortoises remained in their burrows all night significantly more than animals located outside the enclosure, which would be expected because more burrows were damaged outside of the enclosure. The increased time spent outside of their burrows likely exposes desert tortoises to greater risk of predation and to temperature extremes.

Common ravens can be attracted to livestock waters, carcasses of livestock, and some range improvements. Common ravens are likely better able to survive and have greater reproductive success because of ranching activities. Increasing the number of potential predators poses a greater level of risk of predation to desert tortoises; additionally, common ravens attracted to carcasses and range improvements may also feed on desert tortoises. In a similar vein to that discussed in the previous paragraph, more range improvements over a greater area likely provide greater level of subsidy than a limited number of cattle facilities; large subsidies likely lead to greater numbers of common ravens, which, in turn, would be able to consume more desert tortoises.

We do not have information that conclusively links livestock grazing to recent declines in the numbers of desert tortoises in California. Until recently, the eastern Mojave Desert supported the highest densities of desert tortoises and was also the region most heavily used for cattle grazing. However, the effects of grazing may function in combination with other factors in the environment to lower the fitness of desert tortoises.

Livestock grazing, as implemented under the direction of the California Desert Conservation Area Plan, likely kills or injures desert tortoises. The magnitude of the mortality of desert tortoises attributable to the trampling of individuals or their burrows and increased predation by common ravens is extremely difficult to quantify, simply because cattle, common ravens, and desert tortoises are so widely distributed.

As noted previously in this section, until recent declines occurred, desert tortoises in the eastern Mojave Desert of California seemed to persist in the presence of cattle. For this reason, we

assume that cattle do not likely kill many desert tortoises, although we are aware that some individuals are killed by grazing livestock. We are unaware of any positive effects of livestock on desert tortoises.

Sheep grazing affects desert tortoises in ways that are similar to grazing by cattle. The primary differences are related to the timing of sheep grazing and their management within tight bands. Because sheep are grazed in the Mojave Desert only during the spring months, the range improvements used for their grazing are temporary; additionally, sheep carcasses would be unavailable for most of the year. Therefore, any subsidies that common ravens receive from sheep would be of limited duration; however, these temporary subsidies may increase reproductive success of some pairs of common ravens because the sheep grazing overlaps temporally with their nesting period. Sheep are more likely to trample desert tortoises than cattle because they are managed in tight bands of over 1,000 animals; as with cattle, smaller desert tortoises are at greater risk of being trampled than larger individuals. In a study using various sizes of Styrofoam models, sheep trampled 20 percent of the juvenile “desert tortoises” and only 2 and 3 percent of the adult- and subadult-sized models (Tracy 1996 in Boarman 2002). Other studies have demonstrated that sheep also destroy desert tortoise burrows (Berry 1978, Nicholson and Humphreys 1981, Tracy 1996, and Webb and Stielstra 1979 in Boarman 2002).

An additional consideration when one is evaluating the effects of the Bureau’s livestock grazing program on desert tortoises is that the Bureau does not authorize grazing at the same level every year. The number of animal unit months that are authorized varies with the condition of the forage. This variation in animal unit months is particularly important with regard to cattle; in the case of sheep grazing, the Bureau may not authorize any sheep grazing at all if forage conditions are not appropriate. Additionally, when the Bureau authorizes grazing in any given year, it cannot predict the precise areas within an allotment where grazing will occur. Consequently, given the variation in levels of authorization, grazing patterns, and the distribution of desert tortoises, any analysis of the effects of livestock grazing on this species lacks precision.

The Bureau approves numerous actions and makes decisions throughout the year with regard to the grazing of livestock in the California Desert Conservation Area; these actions and decisions range from day-to-day decisions on the abundance of forage, the results of health assessments, development of range improvements, annual authorizations, and allotment management plans. Since the listing of the desert tortoise (and designation of its critical habitat), the Bureau and Service have consulted numerous times on livestock grazing; the provisions of the West Mojave Plan have modified the Bureau’s previous proposed actions that we evaluated in those biological opinions, which have considered the effects of the grazing program on the desert tortoise (and, where appropriate, its critical habitat) in the planning area. Our analyses have taken into consideration the overall effects of livestock grazing and the types of decisions and actions that the Bureau makes with regard to the management of livestock. For this reason, we do not consider it necessary to consult on future actions that are within the scope and intent of management that we considered in this and previous consultations. Therefore, although we welcome any opportunity to coordinate with the Bureau, we do not consider consultation to be necessary on actions such as day-to-day decisions on the abundance of forage, the results of health assessments, annual authorizations, and other minor activities that do not alter the basic

effects of the actions upon which we have consulted previously. The development of range improvements and allotment management plans can alter the basic workings of an allotment and, in turn, the effects on the desert tortoise (and its critical habitat); therefore, the Bureau should continue to consult on these actions. In conclusion, the Bureau and Service will not consult on grazing issues again, except as noted for the development of specific range improvements and allotment management plans, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16.

Effects of Livestock Grazing on Critical Habitat

Livestock grazing affects habitat of the desert tortoise in numerous ways. Most of the effects are subtler than those of construction projects where the primary constituent elements of critical habitat can be removed quickly, totally, and permanently. For this reason, we have generally described each primary constituent element of critical habitat of the desert tortoise and then evaluated the effects of livestock grazing on specific aspects of the primary constituent element.

A primary constituent element of critical habitat of the desert tortoise is the maintenance of sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow. Livestock grazing does not result in the complete and total removal of the primary constituent elements of critical habitat on every acre of every allotment. The development of range improvements within an allotment, such as the construction of stock tanks and corrals, could remove some areas that support the primary constituent elements of critical habitat; in some cases, these facilities could be located in previously disturbed areas that do not support the primary constituent elements. The primary constituent elements of critical habitat may also be completely removed from areas where livestock congregate in large numbers for extended periods of time. In relation to the size of the allotments, these areas are very restricted in size. Most of the activity associated with grazing of cattle and its effects are more widely scattered over space and time; the effects of sheep grazing are somewhat different because they graze in tight bands.

The second primary constituent element of critical habitat of the desert tortoise comprises sufficient quality and quantity of forage species and the proper substrate conditions to provide for the growth of these species. Livestock grazing decreases the amount of plant cover and biomass and can change the species composition of plant communities over large areas (Lovich and Bainbridge 1999). Humphrey (1958, 1987 in Boarman 2002) noted that livestock was implicated in the conversion of grass-dominated communities to shrub lands; however, other factors such as fire suppression, rodents and other herbivores, and competition probably influenced the conversion. (Note that this review primarily evaluated native grasslands of Arizona, New Mexico, and Texas; the Mojave Desert in California likely did not support extensive grasslands in historic times.) Other authors note that grazing reduces the amount of herbaceous species and increases that of woody species (Roundy and Jordan 1988, Vaughan 1982 and 1984 in Service 1994b) and that non-native species, such as Mediterranean grass and cheatgrass (*Bromus tectorum*), benefit from grazing (Berry and Nicholson 1984 and Kie 1990 in Service 1994b). Desert tortoises feed primarily on herbaceous species; therefore, the

replacement of native herbaceous species with shrubs, which they generally do not consume, results in a net loss of appropriate forage for desert tortoises.

Avery (1998) found that a grazed area had a significantly lower diversity of winter annuals when compared to an ungrazed area. In addition, the ungrazed area contained more individuals of the desert dandelion (*Malacothrix glabrata*), a forage plant preferred by desert tortoises. The ungrazed and grazed areas did not differ in biomass, cover, density and species richness of annual plants. Boarman (2002) notes that, because the ungrazed area had been fenced to exclude cattle for only 12 years, the effects of previous grazing may still be present. Changes in species composition could be unfavorable to desert tortoises if palatable and nutritious plants are replaced by those that do not provide adequate nutrition.

Non-native grasses have spread to the deserts and other arid areas of North America and reduced the relative abundance of native species (Mack 1981, D'Antonio and Vitousek 1992, and Rundel and Gibson 1996 in Avery 1998); livestock grazing has, at least, contributed to their spread. Regardless of whether they are native or introduced, annual desert grasses contain less crude protein, calcium, sodium, and water than desert forbs (Oftedal et al. 1993 and McArthur et al. 1994 in Avery 1998). Avery (1998) found that desert tortoises eating Mediterranean grass (*Schismus* spp.) *ad libitum* exhibited a negative nitrogen balance. Generally, turtles consuming a diet low in protein (i.e., where the nitrogen concentration in forage is low) experience reduced growth rates (Gibbons 1967, 1970, Parmenter 1980, Vogt and Guzman 1988, and Avery et al. 1993 in Avery 1998) and lower egg production (White 1993 and Henen 1993, 1997 in Avery 1998). Because desert tortoises are more vulnerable to predation when they are smaller, reducing their rate of growth may eventually result in fewer individuals reaching breeding age. Additionally, decreases in the number of eggs would reduce eventual recruitment into the adult population. If growth rates and egg production are lowered over wide areas for long periods of time, a decline in the population would be likely. Avery (1998) also noted that Mediterranean grass had high concentrations of heavy metals; we are uncertain how these elements affect the desert tortoise. Because desert tortoises require a diet of a variety of herbaceous species that provided important nutrients, the replacement of native herbaceous species with non-native herbaceous species, which are less nutritious, results in a net loss of appropriate forage for desert tortoises. Finally, desert habitats that have been invaded by Mediterranean grass, brome grass (*Bromus* spp.), and Sahara mustard are prone to wildfire; the effects of fire on desert tortoises and their habitat are discussed elsewhere in this biological opinion.

As discussed in the Status of the Species section of this biological opinion, neonate desert tortoises consume germinating annual plants. These small plants would be trampled by livestock and, depending on the number and distribution of livestock, could be eliminated from the forage base in a local area. Because neonate desert tortoises are less likely to be able to travel great distances in safety for food, the effects of grazing in a local area may be relatively greater on them than on sub-adults and adults.

Livestock grazing can also damage soil crusts (Lovich and Bainbridge 1999) and thereby affect the ability of the land to maintain the proper substrate conditions to provide for the growth of sufficient quality and quantity of forage species. Disturbance to soil crusts may increase erosion

by wind and water, which could result in further damage to plants in surrounding areas. The loss of cryptogamic or microbiotic crusts, which are composed of nitrogen-fixing lichens and fungi, may reduce the ability of substrates to support native annual plants; the disturbance of crusts also likely reduces the amount of favorable germination sites for seeds of native annual plants and the moisture-holding capacity of the soils. A study by DeFalco (et al. 2001) demonstrated that the higher nitrogen content of substrates with microbiotic crusts may allow non-native herbaceous species to grow faster and thus attain a competitive advantage over native plant species. An implication of this study is that the spread of non-native species may be more detrimental to native ecosystems than was previously thought because undisturbed substrates may not provide a competitive advantage to native plant species.

Sheep graze differently than cattle; that is, they often pull plants from the ground rather than biting off portions. Also, they are grazed in tight bands that often contain well over 1,000 individuals. For these reasons, sheep can have severe local impacts on this primary constituent element of critical habitat. For example, a band of sheep can remove most of annual plants and trample most of the substrate, including any cryptogamic crusts, in a local area in a fairly short period of time. In large areas of the western Mojave Desert where sheep have grazed over time, most of the native annual plants are confined to the coppice mounds of shrubs that afford them some protection from grazing. The vegetation in the intershrub areas is dominated by Mediterranean grass and filaree (*Erodium cicutarium*), both of which are not native. The lack of a diverse assemblage of native annual species in such areas may compromise the ability of desert tortoises to obtain the nutrients they require. We acknowledge that sheep grazing has not altered the flora of other areas of the western Mojave Desert as dramatically as in the area southwest of Barstow; other factors may also be affecting how a given area reacts to grazing pressure.

The third primary constituent element comprises suitable substrates for burrowing, nesting, and overwintering. The desert tortoise spends a considerable portion of its life underground, where it can avoid predators and the temperature extremes of the desert; they also lay their eggs at the mouths of their burrow in shallow holes. Therefore, substrates that are suitable for these functions are crucial for the recovery of the species. Although livestock may occasionally trample a burrow, they generally do not alter the substrates throughout allotments to the degree that burrowing is no longer possible. Livestock can, however, substantially alter the substrate in areas where they congregate on a frequent basis. Through alteration of the basic structure of the substrate, livestock render these areas unsuitable for burrowing or placement of nests. Livestock tend to congregate near salt licks and tanks and are occasionally restrained in corrals; the substrates in these areas are highly unlikely to be able to support burrowing and nesting by desert tortoises.

Burrows, caliche caves, and other shelter sites comprise the fourth primary constituent element of critical habitat. Livestock can crush burrows that are not protected from trampling. They also can damage shrubs to the extent that the plants no longer provide adequate cover for desert tortoises; livestock damage shrubs when they push into them to graze herbaceous plants growing on coppice mounds at the base of the shrubs and to seek shade. Most caliche caves are likely protected from crushing by their location in steeper banks and by the harder composition of the substrate. A reduction of the number of shelter sites within the territory of the desert tortoise is

likely to cause the resident animal to spend more time in the open and seeking or constructing burrows; energy expended in these activities cannot be used for foraging and reproduction.

The fourth primary constituent element of critical habitat of the desert tortoise is sufficient vegetation for shelter from temperature extremes and predators. Avery (1998) found that a grazed area had significantly larger creosote bushes (*Larrea tridentata*), more dormant or dead burrobushes (*Ambrosia dumosa*), fewer and smaller individuals of galleta grass (*Hilaria rigida*), and more individuals of cheesebush (*Hymenoclea salsola*, an indicator of disturbance) when compared to an ungrazed area. Boarman (2002) notes that, because the ungrazed area had been fenced to exclude cattle for only 12 years, the effects of previous grazing may still be present. Changes in species composition could be unfavorable to desert tortoises if plants that provide less cover are replaced by those that do not provide desert tortoises with adequate protection. Note that the differences in shrub cover (larger creosote bushes, more dormant or dead burrobushes, more individuals of cheesebush) Avery described, as discussed in this paragraph, do not universally constitute adverse effects on the desert tortoise. Because of their usual structure, burrobushes generally provide better shelter sites than cheesebush; however, larger creosote bushes are likely more than suitable cover sites.

The final primary constituent element is habitat protected from disturbance and human-caused mortality. As discussed in the Effects on the Desert Tortoise section of this livestock element, implementation of the Bureau's guidance for livestock grazing likely results in few desert tortoises being directly killed or injured. Except for times when cattle are being actively driven, activity levels associated with cattle grazing seems to be relatively minor. The transport of sheep into grazing areas and the movement of sheep in tight bands constitutes a greater level of activity.

As we noted in the discussion of the effects of livestock grazing on desert tortoises, several factors involved in this analysis involve a large degree of variation. First, the Bureau does not authorize grazing at the same level every year. The number of animal unit months that are authorized varies with the condition of the forage. This variation in animal unit months is particularly important with regard to cattle; in the case of sheep grazing, the Bureau may not authorize any sheep grazing at all if forage conditions are not appropriate. Additionally, when the Bureau authorizes grazing in any given year, it cannot predict the precise areas within an allotment where grazing will occur. Consequently, given the variation in levels of authorization, grazing patterns, and the patchiness of the distribution of the primary constituent elements of critical habitat, any analysis of the effects of livestock grazing on critical habitat lacks precision.

Effects of the Bureau's Management Prescriptions for Livestock Grazing

Effects on the Desert Tortoise

The Bureau has proposed to remove cattle carcasses that are located within 300 feet of a road or watering source within 2 days. This action will reduce, to some degree, food subsidies to common ravens. If the reduction in food base reduces the number of common ravens, the amount of predation on desert tortoises by common ravens may decrease. The removal of

carcasses may not affect the number of common ravens in the region because so many other factors are involved, such as the amount of food available to common ravens that is not associated with cattle carcasses. Additionally, because a relatively small area of the desert is located within 300 feet of roads or watering sources, we expect that, unless cattle die at a substantially higher rate adjacent to roads than elsewhere, a small portion of dead cattle will be found in such areas. Ranchers traveling cross-country in their vehicles to remove carcasses may crush desert tortoises; however, because the Bureau will limit the distance ranchers may travel off of roads, we expect that few desert tortoises would be killed or injured while carcasses are being removed. Given the size of some allotments, the potential exists that carcasses may be well-scavenged before anyone finds them. If carcasses are thoroughly scavenged when they are found, they will no longer provide food to common ravens. Leaving them in place is likely to pose less risk to desert tortoises than driving cross-country to collect them; additionally, the bones from these carcasses can also provide desert tortoises with a source of calcium over time. Consequently, the removal of cattle carcasses may benefit desert tortoises; however, we expect that the benefits will be difficult to measure.

The voluntary relinquishment of all grazing use would provide substantial conservation benefits to desert tortoises in areas that are most heavily affected by livestock and the activities of the ranchers. These areas of concentrated livestock and human use are where desert tortoises are most likely to be trampled by cattle or crushed by human activities associated with grazing. The removal of livestock would reduce the level of subsidy (e.g., water, food in the form of carcasses and afterbirth, and nesting sites) for common ravens. The magnitude of this benefit would vary with the status of the desert tortoise in the specific allotment.

The Bureau will modify all cattle guards in habitat of the desert tortoise within 3 years of adoption of the West Mojave Plan to prevent entrapment of desert tortoises. Because desert tortoises can be trapped and die in poorly designed cattle guards, this measure will reduce or possibly eliminate mortality from this source and will therefore promote the conservation of the desert tortoise. Although we are aware that some desert tortoises have been trapped in cattle guards, we do not know how frequently such entrapment may occur.

The Bureau's decision to prohibit issuance of temporary non-renewable grazing permits in desert wildlife management areas for all lands below an elevation of 4,000 feet will ensure that additional cattle are not present during the times when desert tortoises are foraging most actively. Consequently, the threat of trampling will not increase during this period.

Granting ephemeral authorization in cattle allotments that are not located within the boundaries of desert wildlife management areas when ephemeral production exceeds 230 pounds per acre would expose desert tortoises to a greater risk of trampling because more cattle would be using the allotment. As we have stated previously, the overall risk of cattle trampling desert tortoises is likely low; the likelihood is less on these allotments where desert tortoises occur in lower densities.

Many of the management prescriptions for sheep are similar to those for cattle and would, in general, ameliorate the effects to desert tortoises in the same manner. As we noted in the

discussion of the effects of livestock grazing on desert tortoises, sheep likely trample smaller desert tortoises more frequently than cattle because of the manner and numbers in which they graze. To attempt to reduce the threat of trampling, the Bureau will limit the number of sheep that can be combined in a band, after the removal of lambs, to 1,600 adult sheep. We are not aware of any data that indicate how the size of a band affects trampling rates. Intuitively, smaller bands may trample fewer desert tortoises; consequently, this measure may reduce the mortality of desert tortoises. Additionally, any measure that results in sheep being removed from habitat of the desert tortoise because of forage limitations will reduce the likelihood of trampling.

The removal of sheep from the 10,633-acre Mojave Monkeyflower Conservation Area in Brisbane Valley is likely to protect desert tortoises to a substantial degree, primarily because desert tortoises likely persist in this area in moderate densities. We note that the Bureau's proposal to "work with the lessee to clearly identify monkeyflower habitat to be avoided" may be insufficient to prevent sheep from entering this conservation area. We base this statement on the fact that flocks of sheep have regularly entered Edwards Air Force Base for many years, even though the boundary is fenced; we are unclear on the precise mechanism, but the fence often seemed to break in areas of abundant forage.

Effects on Critical Habitat

The removal of cattle carcasses will not, in and of itself, affect the primary constituent elements of critical habitat. Cross-country driving associated with the removal of carcasses could affect the primary constituent elements of critical habitat by crushing annual plants that desert tortoises consume, damaging shrubs that they use for cover, and altering substrates by causing compaction or accelerating erosion. Because cattle would only be removed when they are found within 300 feet of a road, we expect that little cross-country vehicular travel is likely to occur as a result of this activity. We expect that ranchers would remove relatively few cattle from a limited portion of critical habitat; therefore these effects are likely to be extremely limited in scale.

The voluntary relinquishment of all grazing use by a lessee would benefit the conservation role and function of critical habitat units by eliminating all adverse effects to the primary constituent elements associated with grazing. Livestock grazing can alter the shape, size, and structure of shrubs that provide shelter to desert tortoises. In areas that are not heavily disturbed by grazing, this primary constituent element of critical habitat may return within a relatively brief period of time, particularly if a series of normal or high rainfall years follows the retirement of grazing. The return of some primary constituent elements of critical habitat, such as appropriate substrates and composition of native forage plants, to pre-grazing conditions is likely to take much longer, particularly around watering sites and corrals where livestock concentrated their activities. The potential exists that different species of plants would colonize these disturbed areas before these sites once again resemble the local plant community. Non-native species that have been spread by and have thrived under a regime of livestock grazing are likely to persist for decades; the potential exists that these species will never be completely removed from the landscape. The magnitude of this benefit would vary with the amount of critical habitat that is grazed within each critical habitat unit; we would expect to see immediate benefits during times of the year

when desert tortoises are actively foraging because competition for resources with livestock would have been eliminated.

Modifying existing cattle guards and installing new ones in a manner to prevent entrapment of desert tortoises is likely to cause extremely localized effects to the primary constituent elements of critical habitat because of the small work area that would likely be required. These localized and primarily temporary effects would certainly not compromise the conservation role and function of any critical habitat unit.

The Bureau's decision to prohibit issuance of temporary non-renewable grazing permits in desert wildlife management areas for all lands below an elevation of 4,000 feet will ensure that desert tortoises will not face additional competition from cattle for annual plants during the times when they are foraging most actively. The nutritional balance of desert tortoises is one of the keys to their survival; years of above-average rainfall and abundant forage may allow young desert tortoises to grow more rapidly and all individuals to improve their overall health. This proposed action may assist substantially in allowing desert tortoises to make use of the forage component of the primary constituent elements of critical habitat.

Many of the management prescriptions for sheep are similar to those for cattle and would, in general, ameliorate the effects to the primary constituent elements of critical habitat in a similar manner. Because the effects of sheep grazing on the quality and quantity of forage species and the substrate conditions to provide for the growth of these species tend to be more intense than those of cattle, prescriptions that reduce the level of sheep use likely provide a relatively greater degree of benefit. Consequently, reducing the effect of sheep grazing on this primary constituent element of critical habitat would promote the conservation role and function of the critical habitat unit.

Effects of the Proposed Grazing Program on the Desert Tortoise and its Critical Habitat

In this section, we will evaluate the effects of grazing within each allotment on the desert tortoise and its critical habitat, where applicable. Livestock grazing occurs on both public and private lands in a manner that is more or less inter-related, depending upon the specific circumstances surrounding the allotment. Additionally, grazing by sheep and cattle differs in some general, fundamental aspects.

For example, public lands comprise all or a large portion of some allotments; in the latter case, Bureau and private lands are also usually intermixed. For example, the Lava Mountain Allotment is composed exclusively of public lands. The Hansen Common and the southern portion of the Rudnick Common allotments, where they overlap habitat of the desert tortoise, provide an example of areas where public and private land are completely interwoven; in such allotments, grazing generally occurs in a uniform manner across the landscape because the boundaries between public and private land are not easily determinable. Consequently, in cases where the pattern of land ownership dictates that the manner of grazing is highly unlikely to cause different levels of effects between public and private lands, we will consider the effects of grazing on both public and private lands.

In contrast, some livestock allotments contain substantially more private than public land; in several cases, the private land occurs in large contiguous blocks, such as in the vicinity of California City and south of Edwards Air Force Base. In such areas, livestock operators graze sheep in a fundamentally different manner than is required by the Bureau on public lands. For example, operators will move sheep over the same area more than once in a season (in contrast with the one pass allowed by the Bureau); they will also operate in areas with less forage and frequently graze on private lands before and after the Bureau opens public lands to grazing, when forage conditions are appropriate. Finally, the public land health standards and the regional standards and guidelines under which the Bureau operates on public lands are not in force on private lands. Consequently, the effects on the desert tortoise and its critical habitat of grazing on large blocks of private lands are highly likely to be substantially different than those on public lands and in situations where public and private lands occur in a checkerboard pattern.

Because these large blocks of private land provide an adequate resource, livestock operators can and do graze sheep on such lands independently of authorized use of public lands. Finally, the environmental impact report and statement states that the Bureau's proposed grazing programs affect public lands only. The environmental impact report and statement does not address the grazing of livestock on private land (Bureau et al. 2005: section 2.2.5.2 regarding cattle; section 2.2.5.5 regarding sheep). Consequently, this biological opinion does not evaluate the effects of the livestock grazing on large blocks of private lands.

The Bureau will no longer authorize grazing on certain allotments for various reasons. Specifically, the Cronese Lake, Cady Mountain, and Harper Lake allotments have been acquired by the Department of the Army to offset the use of additional training lands at Fort Irwin. The area in which the Goldstone Allotment is located has been transferred to the Department of the Army. The Gravel Hills and Superior Valley allotments are located entirely within critical habitat of the desert tortoise. The Pilot Knob Allotment has been purchased by a conservation buyer. Because of the lack of public lands outside of critical habitat, the Bureau does not expect to authorize grazing on the Buckhorn Canyon Allotment; it has not been grazed since 1987 (Bureau 2005c). Because desert tortoises and their critical habitat will not be affected by grazing in these areas, we will not analyze the effects of grazing on these allotments in this biological opinion. The acreages reflected in the following discussion of specific allotments include only those areas that would be affected by the Bureau's proposed action; that is, they do not include large blocks of private lands where grazing may occur in a manner that is substantially different than that managed by the Bureau.

Bissell Allotment

The Bissell Allotment is grazed by sheep. It is located north of Highways 58; the majority of the allotment is within the corporate boundary of California City. Most of the land is within private ownership; the Bureau manages several scattered parcels. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the Bureau (2005c) and the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	2,360	0	2,360
Other Lands	0	46,529	0	46,529
Totals	0	48,889	0	48,889

The Bissell Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises likely occur in low densities here as a result of past grazing, off-road vehicle use, and other human activities. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise on public lands is not substantially degraded from its current condition. We are unable to assess the effects of grazing on the desert tortoise in the remainder of the allotment because of the large amount of private land; these areas are outside of the action area of this consultation.

Boron Allotment

The Boron Allotment is grazed by sheep. It is located northwest of the junction of Highways 58 and 395. The eastern portion of the allotment is in primarily a checkerboard pattern of land ownership; the central and western portions are largely in private ownership. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information in the following table is from the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	10,868	0	10,868
Other Lands	0	71,993	0	71,993
Totals	0	82,861	0	82,861

This allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises likely occur in low densities here as a result of past grazing, off-road vehicle use, and other human activities. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise on public lands is not substantially degraded from its current condition. We are unable to assess

the effects of grazing on the desert tortoise in the central and western portions of the allotment because of the large amount of private land; these areas are outside of the action area of this consultation.

Cantil Common Allotment

The Cantil Common Allotment is grazed by sheep. It is located east of Highway 14 from just north of Highway 58 to south of Highway 178. The allotment is partially within the corporate boundary of California City. Most of the land within the portion of the allotment south of the Rand Mountains is privately owned; the Bureau manages most of the land within the allotment in and north of the Rand Mountains. The following table depicts the distribution of desert tortoise habitat in relation to land ownership under the grazing system implemented by the Bureau. The information is from the Bureau (2005c) and the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	6,196	197,371	0	203,567
Other Lands	5,442	121,992	0	127,434
Totals	11,638	319,363	0	331,001

The Cantil Common Allotment is partially located within a desert wildlife management area. Desert tortoises occur in low densities as a result of past grazing, off-road vehicle use, and other human activities. North of the Rand Mountains, off-road vehicle use has not been as prevalent as it is on the private land to the south. Additionally, the number of desert tortoises was likely historically lower north of the Rand Mountains because this area is nearing the northern and western edges of their range. The Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands and on interspersed non-federal lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise on public lands is not substantially degraded from its current condition. We are unable to assess the effects of grazing on the desert tortoise in the portions of the allotment that consist of large blocks of private land; these areas are outside of the action area of this consultation. These areas include private lands in the southern portion of the allotment that lie south of the Rand Mountains and in the northern portions of the allotment that lie in the southern Indian Wells Valley and due west of the boundary of the Naval Air Weapons Station, China Lake (see attached map of the northern and southern portions of this allotment).

Approximately 6,196 acres of critical habitat on public lands within the Fremont-Kramer Critical Habitat Unit would be grazed (Chavez 2005b). The Bureau will use roads to define manageable boundaries of grazed areas, rather than relying on the boundaries contained in the final rule for the designation of critical habitat of the desert tortoise; in many cases, the boundaries of critical

habitat were drawn on section lines, which cannot be detected on the ground. This amount of grazing will not compromise the conservation role and function of critical habitat because it will affect only a small portion at the edge of the 518,000-acre Fremont-Kramer Critical Habitat Unit.

Hansen Common Allotment

The Hansen Common Allotment is grazed by both cattle and sheep. It is located west of Highway 14 and south of Red Rock Canyon State Park. Most of the allotment is not located within habitat of the desert tortoise; within the area where desert tortoises are most likely to occur, the Bureau manages most of the land (see maps 3-1 and 3-10 of the final environmental impact report and statement). Cattle grazing generally does not occur within habitat of the desert tortoise; desert tortoise habitat is grazed by sheep (Sjaastad 2005a). The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	2,747	32,101	34,848
Other Lands	0	962	36,292	37,254
Totals	0	3,709	68,393	72,102

The Hansen Common Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises likely occur in low densities here as a result of past grazing, off-road vehicle use, and other human activities; additionally, this area occurs at the western edge of their range in this portion of the desert. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in this area. Given the small area of private land that would also be grazed (962 acres) and its proximity to a larger amount of public lands, we anticipate that the effects of grazing throughout this area would be similar; consequently, we expect that few desert tortoises are likely to be killed or injured on private lands within this allotment. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition.

Johnson Valley Allotment

The Johnson Valley Allotment is an ephemeral allotment; it is currently vacant but may be grazed by sheep at some time in the future. It is located northeast of Highway 247. Most of the allotment is located on public land. The following table depicts the distribution of desert tortoise

habitat in relation to land ownership. The information is from the final environmental impact report and statement and Chavez (2005f).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	429	108,734	0	109,163
Other Lands	0	9,134	0	9,134
Totals	429	117,868	0	118,297

The Johnson Valley Allotment is not located within a desert wildlife management area; it overlaps, to a large degree, the Johnson Valley Off-highway Vehicle Management Area. A small portion of the allotment overlaps the Ord-Rodman Critical Habitat Unit; as in the case with the Cantil Common Allotment, our mapping of the critical habitat unit followed section lines and the Bureau's allotment boundaries follow roads.

Desert tortoises occur in low densities within the Johnson Valley Allotment as a result of past grazing, off-road vehicle use, and other human activities. Consequently, the Service has not considered most of the lands within this allotment as important for the recovery of the desert tortoise. The grazing of approximately 433 acres of critical habitat on private lands, which would not occur but for the Bureau's authorization of grazing on public lands in this allotment, will not compromise the conservation role and function of the Ord-Rodman Critical Habitat Unit because it will affect a minor portion of the 253,200-acre critical habitat unit. Additionally, the areas that are potentially open for grazing are located on the edge of the critical habitat unit, on the opposite side of Camp Rock Road from most of the critical habitat unit and the desert wildlife management area that the Bureau proposes to manage for the recovery of the desert tortoise. The road forms much a more manageable boundary than the actual lines of the critical habitat designation.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public or private lands; relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition.

Lava Mountain Allotment

The Lava Mountain Allotment is grazed by sheep. It is located east of Highway 395 and north of the Fremont-Kramer and Superior-Cronese critical habitat units. The Bureau manages the entire allotment. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	2,165	18,737	0	20,902
Other Lands	0	0	0	0
Totals	2,165	18,737	0	20,902

The Lava Mountain Allotment is not located within a desert wildlife management area. Desert tortoises likely occur in low densities, based on the information available from the adjacent Naval Air Weapons Station, China Lake. The Service has not considered most of this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition.

Approximately 2,165 acres of critical habitat on public lands within the Fremont-Kramer and Superior-Cronese critical habitat units would be grazed. The Bureau will use roads to define manageable boundaries of grazed areas, rather than relying on the boundaries contained in the final rule for the designation of critical habitat of the desert tortoise; in many cases, the boundaries of critical habitat were drawn on sections lines, which cannot be detected on the ground. This amount of grazing will not compromise the conservation role and function of critical habitat because it will affect only small portions of habitat at the edges of the 518,000-acre Fremont-Kramer Critical Habitat Unit and the 766,900-acre Superior-Cronese Critical Habitat Unit.

Monolith-Cantil Allotment

The Monolith-Cantil Allotment is grazed by sheep. It is located west of Highway 395 and south of the Rand Mountains. The Bureau manages most of the portion of the allotment within San Bernardino County; approximately 700 acres in this portion of the allotment are privately owned. A large block of private land within the allotment lies within Kern County (see attached map). The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from LaPre (2005m).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	10,825	0	10,825
Other Lands	0	3,544	0	3,544
Totals	0	14,739	0	14,739

The Monolith-Cantil Allotment is not located within a desert wildlife management area or in critical habitat. Desert tortoises occur in low densities here as a result of past grazing, off-road vehicle use, and other human activities. The Service has not considered most of this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition.

We are unable to assess the effects of grazing on the desert tortoise within the large block of private land that is located within Kern County. This area, which covers approximately 2,800 acres, is outside of the action area of this consultation.

Ord Mountain Allotment

The Ord Mountain Allotment is grazed by cattle. It is located east of Highway 247 and south of Interstate 40. The Bureau manages most of the lands within the allotment, although the operator owns several thousand acres within its boundaries. Given the proximity of private lands to public lands, we consider all of the private lands to be within the action area. The following table depicts the distribution of desert tortoise habitat in relation to land ownership; the acreages in this table include lands over 4,000 feet in elevation on which desert tortoises are likely to be less abundant. The information is from LaPre (2005j).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	107,961	28,144	0	136,105
Other Lands	17,193	1,559	0	18,752
Totals	125,154	29,703	0	154,547

The Ord Mountain Allotment is located within the Ord-Rodman Desert Wildlife Management Area. Densities of desert tortoises vary throughout the allotment; they are likely most common on alluvial fans at lower elevations. Portions of the allotment at higher elevations, specifically along Camp Rock Road, have been heavily grazed to the degree that the plant associations typically found in such locations are absent. Desert tortoises are likely scarce or possibly absent from such areas. These areas may be located on private lands.

Within the Ord Mountain Allotment, the Bureau's exclusion of cattle from March 15 to June 15 from 34,185 acres of the desert wildlife management area when forage levels fall below 230 pounds will reduce, to some degree, the effects of cattle grazing on desert tortoises on public lands. The potential exists that the operator may move the cattle entirely to private lands during this time; if this situation occurs, the quality of habitat on private lands will continue to be degraded. If, as we noted in the previous paragraph, desert tortoises are scarce or absent on the

private lands where the quality of habitat is heavily degraded, concentrating cattle in these areas for 3 months of the year may have no further effect on individuals or their habitat.

We note that approximately 5,000 acres of the private lands within the Ord Mountain Allotment are located within areas over 4,000 feet in elevation (Bureau 2004b); these areas are likely not important for the conservation of desert tortoises simply because of their greater elevation. Conversely, approximately 13,700 acres of private land may be situated in habitat that is of higher quality for desert tortoises and may be subject to increased grazing pressure. Although the amount of private land within the allotment that is below 4,000 feet in elevation is not trivial, it is scattered over a large area and constitutes a relatively small portion of the Ord-Rodman Desert Wildlife Management Area. For these reasons, cattle grazing, as the Bureau proposes to manage it in the desert wildlife management areas, will not reduce appreciably the reproduction, numbers, or distribution of the desert tortoise in the Western Mojave Recovery Unit.

The Ord Mountain Allotment is the only allotment of substantial size within critical habitat where grazing continues to occur in the planning area. This allotment contains approximately 107,961 acres of critical habitat on public lands that lie within the 253,200-acre critical habitat unit. As we noted previously in this biological opinion, most desert tortoises reside at elevations between 1,000 and 3,000 feet and large portions of the Ord Mountain Allotment are located at 4,000 feet or higher in elevation; these areas of higher elevation likely do not support the primary constituent elements of critical habitat on a widespread basis. We cannot quantify the area within the boundaries of the critical habitat unit that do not support the primary constituent elements because of elevation; however, we can use the distribution of desert tortoise sign as an indication of suitable habitat. During surveys conducted from 1998 through 2002, the highest counts of desert tortoise sign were detected in the northwestern, southwestern, and eastern portions of the Ord-Rodman Critical Habitat Unit; all of these areas lie below 4,000 feet in elevation (Bureau 2003b); the map seems to indicate that a limited amount of sign was detected above 4,000 feet, seemingly on south-facing bajadas and in canyons. In summary, based on the available data, we cannot assess the precise amount of critical habitat within the Ord-Rodman Critical Habitat Unit that supports the primary constituent elements; we note that this is the case for every critical habitat unit but the situation is more pronounced in this region because of the prominence of high elevation areas.

Other factors confound the assessment of the effects of cattle grazing on the Ord-Rodman Critical Habitat Unit. First, the Bureau notes, in the final environmental impact report and statement, that the Ord Mountain Allotment is “not achieving public health standards in habitat for the desert tortoise.” Specifically, approximately 9 percent (10,000 acres) of the allotment did not achieve the species standard during a rangeland health assessment in 1999 (Chavez 2005c). Some of the areas that did not meet standards were at higher elevations, in locations that do not support the primary constituent elements of critical habitat of the desert tortoise. The Bureau assesses only the portion of the allotment that lies on public lands.

Second, the primary constituent elements within the Ord-Rodman Critical Habitat Unit are not uniformly distributed; the higher elevations of the Ord, Rodman, and Newberry Mountains separate areas of more suitable habitat for the desert tortoise. Consequently, the more scattered

distribution of the primary constituent elements (when compared with other areas, such as in the Superior-Cronese Critical Habitat Unit) and the uneven grazing levels complicate an overall assessment of the effects of grazing on critical habitat of the desert tortoise. However, most of the larger bajadas where the primary constituent elements of critical habitat are present lie outside of the Ord Mountain Allotment; for this reason and because areas within the allotment continue to support the primary constituent elements, we conclude that this level of grazing is not likely to compromise the conservation role and function of the critical habitat unit.

Rattlesnake Canyon Allotment

The Rattlesnake Canyon Allotment is grazed by cattle. It is located south of Highway 247. Most of the land is the managed by the Bureau. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from Chavez (2005e).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	12,800	14,032	26,832
Other Lands	0	5	1,920	1,925
Totals	0	12,805	15,952	28,757

The Rattlesnake Canyon Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises occur here in low densities, most likely because this area occurs at the edge of their range in this portion of the desert and most of the allotment is located at higher elevations. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public or private lands; additionally, relatively few animals likely reside in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We anticipate that, because of the small amount of private lands, the effects of grazing are likely to be similar throughout habitat of the desert tortoise, regardless of land ownership.

Rudnick Common Allotment

The Rudnick Common Allotment is authorized for grazing by both cattle and sheep. The Bureau will not authorize both uses in the same location. It is located west of Highway 14 and south of Highway 178. Most of the northern portion of the allotment is managed by the Bureau; the southern portion exists in a checkerboard pattern of ownership; the Bureau manages most of the land within the area that desert tortoises are most likely to inhabit. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement and Sjaastad (2005c).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	60,040	103,838	163,878
Other Lands	0	18,960	58,984	77,944
Totals	0	79,000	162,822	241,822

The Rudnick Common Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises occur here in low densities, most likely because this area occurs at the edge of their range. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands or private lands; additionally, relatively few animals likely reside in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We anticipate that, because of the distribution of public and other lands, the effects of grazing are likely to be similar throughout habitat of the desert tortoise, regardless of land ownership.

Shadow Mountain Allotment

The Shadow Mountain Allotment is grazed by sheep. Most of the allotment is located west of Highway 395 and southeast of Edwards Air Force Base; a portion of the allotment extends east of Highway 395. The land ownership throughout large portions of the allotment is a mix of public and non-federal lands; the southwestern edge, southeastern corner, and easternmost portion of the allotment are largely privately owned. The Bureau manages most of the land within the portion of the allotment that overlaps the El Mirage Off-highway Vehicle Management Area. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from LaPre (2005r).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	596	16,965	0	17,561
Other Lands	1,280	31,305	0	32,585
Totals	1,876	48,270	0	50,146

The Bureau would allow grazing within a small portion of the Fremont-Kramer Desert Wildlife Management Area within this allotment. Desert tortoises occur in low densities as a result of past grazing, off-road vehicle use, and other human activities.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands; additionally, relatively few animals likely persist in

this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We are unable to assess the effects of grazing on desert tortoises in the portions of the allotment where private land is present (see attached map of the allotment).

Approximately 596 acres of critical habitat on public lands within the Fremont-Kramer Critical Habitat Unit would be grazed (LaPre 2005j). The Bureau will use Shadow Mountain, Adobe Mountain, and Lake roads to define manageable boundaries of grazed areas, rather than relying on the boundaries contained in the final rule for the designation of critical habitat of the desert tortoise; in many cases, the boundaries of critical habitat were drawn on sections lines, which cannot be detected on the ground. This amount of grazing will not compromise the conservation role and function of critical habitat because it will affect only a small portion at the edge of the 518,000-acre Fremont-Kramer Critical Habitat Unit.

Spangler Hills Allotment

The Spangler Hills Allotment is grazed by sheep. It is generally located between the two land holdings of the Naval Air Weapons Station, China Lake. Most of the allotment is located on public land. Approximately 10,000 acres that are not managed by the Bureau have been withdrawn by the Navy for a corridor between its two land holdings and as part of the Naval Air Weapons Station (Sjaastad 2005b). The Bureau manages grazing within the land that comprises the corridor. Because the withdrawn land is a linear corridor along a road and sheep pose a threat to vehicles and their drivers on the road, the amount of grazing that occurs within this area is probably fairly limited (Sjaastad 2005c). Grazing does not occur on the Naval Air Weapons Station. The State of California and private parties own approximately 800 acres of the allotment. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement, LaPre (2005n), and Sjaastad (2005c).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau and Navy	0	068,183	0	68,183
Other Lands	0	958	0	958
Totals	0	69,141	0	69,141

The Spangler Hills Allotment is not located within a desert wildlife management area; it overlaps, to a large degree, the Spangler Hills Off-highway Vehicle Management Area. Desert tortoises occur in low densities here, partially, as a result of past grazing, off-road vehicle use, and other human activities; additionally, this area is near the edge of the desert tortoise's range. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands or non-federal lands; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We anticipate that, because of the distribution of public and other lands, the effects of grazing are likely to be similar throughout habitat of the desert tortoise, regardless of land ownership.

Stoddard Mountain Allotment

The Stoddard Mountain Allotment is grazed by sheep. It occurs in three sections, to the south and west of Barstow. The eastern portion of the allotment extends from the west side of Highway 247 to Interstate 15; in this section, public lands occur in a braided pattern with non-federal lands. In this area, the allotment overlaps, to a large degree, the Stoddard Off-highway Vehicle Management Area. The middle portion of the allotment lies between Interstate 15 and Highway 66; public lands are generally consolidated in two large blocks in this portion of the allotment. The westernmost portion of the allotment lies west of Highway 66. The Bureau will not authorize grazing in the western portion of the allotment (LaPre pers. comm. 2006). The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from LaPre (2005r).

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	77,536	0	77,536
Other Lands	0	85,307	0	85,307
Totals	0	162,843	0	162,843

The Stoddard Mountain Allotment is not located within a desert wildlife management area or in a critical habitat unit. Desert tortoises occur in low densities here as a result of past grazing, off-road vehicle use, and other human activities. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

In the eastern portion of the allotment, few desert tortoises are likely to be killed or injured on public or non-federal lands under the grazing system proposed by the Bureau for this allotment; additionally, relatively few animals likely persist in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We anticipate that, because of the distribution of public and other lands, the effects of grazing are likely to be similar throughout habitat of the desert tortoise, regardless of land ownership (see attached map of the allotment).

In the Middle Stoddard Allotment, few desert tortoises are likely to be killed or injured on public lands under the grazing system proposed by the Bureau for this allotment; we expect that this area supports relatively few desert tortoises. The Bureau will not allow grazing to occur within the Mojave Monkeyflower Area of Critical Environmental Concern, which occupies 10,633

acres in the Middle Stoddard Allotment; consequently, sheep grazing will not affect desert tortoises in this area. Desert tortoises on approximately 5,787 acres of public land in the Middle Stoddard Allotment will be affected by grazing of livestock (Service 2006). We are unable to assess the effects of grazing on the desert tortoise in the middle portion of the Stoddard Allotment that consists of large blocks of private land; these areas are outside of the action area of this consultation.

Tunawee Common Allotment

The Tunawee Common Allotment is authorized for grazing by both cattle and sheep. The Bureau will not authorize both uses in the same location. Cattle have not grazed the allotment since 1993; sheep have grazed the allotment since 1994 (Bureau et al. 2005). It straddles Highway 395 a few miles north of the Inyo-Kern county line. The Bureau manages all of the land within habitat of the desert tortoise. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	1,800	49,929	51,729
Other Lands	0	0	4,202	4,202
Totals	0	1,800	54,131	55,931

The Tunawee Common Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises occur here in low densities, most likely because this area occurs at the edge of their range. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public lands, primarily because relatively few animals likely reside in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition.

Walker Pass Allotment

The Walker Pass Allotment is grazed by cattle. It is located west of Highway 395 and straddles the Inyo-Kern county line. The Bureau manages most of the land; private lands within habitat of the desert tortoise are interspersed with public lands. The following table depicts the distribution of desert tortoise habitat in relation to land ownership. The information is from the final environmental impact report and statement.

Land Status	Acres within the Allotment			
	Critical Habitat	Other Desert Tortoise Habitat	Not Desert Tortoise Habitat	Total
Bureau	0	26,058	62,100	88,158
Other Lands	0	6,000	2,816	8,816
Totals	0	32,058	64,916	96,974

The Walker Pass Allotment is not located within a desert wildlife management area or critical habitat unit. Desert tortoises occur here in low densities, most likely because this area occurs at the edge of their range. Consequently, the Service has not considered this area as important for the recovery of the desert tortoise.

Under the grazing system proposed by the Bureau for this allotment, few desert tortoises are likely to be killed or injured on public or private lands, primarily because relatively few animals likely reside in this area. The measures proposed by the Bureau should ensure that habitat for the desert tortoise is not substantially degraded from its current condition. We anticipate that, because of the distribution of public and other lands, the effects of grazing are likely to be similar throughout habitat of the desert tortoise, regardless of land ownership.

Summary of the Effects of the Livestock Grazing

Through the proposed amendment of the California Desert Conservation Area Plan within the planning area, the amount of livestock grazing on public lands within the action area that affects the desert tortoise and its critical habitat will decrease a substantial amount. Other allotment-specific measures proposed by the Bureau through the amendment process will also alter the existing situation with regard to grazing.

Effects on the Desert Tortoise

Livestock would no longer graze in the Gravel Hills, Pilot Knob, Harper Lake, Cady Mountain, Buckhorn Canyon, and Cronese Lakes allotments and in portions of the Superior Valley, Lava Mountain, Shadow Mountain, Cantil Common, Monolith-Cantil, Lacey-Cactus-McCloud, and Stoddard Mountain allotments as a result of actions proposed by the Bureau. Consequently, approximately 762,000 acres of desert tortoise habitat within the planning area would not be grazed (Service calculations based on information from the Bureau). (The Goldstone Allotment and the remaining portion of the Superior Allotment will also no longer be grazed. The Army will use these areas for training; consequently, we did not include the acreage of these areas in the amount of ungrazed habitat.)

The decreased number of sheep and cattle on allotments in the planning area would reduce, to some degree, the likelihood that desert tortoises will be trampled. The lack of activity with regard to the construction, operation, and maintenance of range improvements would likely reduce the potential for desert tortoises to be killed by ranchers conducting these activities.

We cannot quantify any change in the level of mortality because of the vast areas involved, the varying densities of desert tortoises, and the randomness with which mortality associated with livestock grazing likely occurs.

The Bureau's proposal to allow voluntary relinquishment of the remaining allotments may further reduce the level of mortality of desert tortoises, if operators opt to pursue this course of action. The establishment of forage thresholds should reduce, to a small degree, the level of mortality of desert tortoises on allotments that will be grazed.

The removal of livestock and their waters will reduce subsidies to common ravens. The carcasses and afterbirth of livestock and artificial waters will no longer be available over large areas to provide common ravens with food and water. We expect that the decrease in the subsidies from livestock grazing will affect the common raven population to some unquantifiable degree. Although a decrease in the number of birds may not be noticeable, the likelihood exists that, to some degree, predation by common ravens on young desert tortoises will decrease.

Grazing would continue on approximately 136,105 acres of habitat that supports or has recently supported moderate to higher densities of desert tortoises, primarily within the Ord Mountain Allotment. (This acreage includes all desert tortoise habitat identified on public lands within the boundaries of the Ord Mountain Allotment (LaPre 2005j).) Grazing would also continue on approximately 646,752 acres of habitat that supports lower densities of desert tortoises. These lower densities result from past and ongoing human activities, lower quality habitat at the edge of the range of the species, or a combination of these factors.

We conclude that the grazing program proposed by the Bureau is not likely to appreciably affect the reproduction, numbers, or distribution of the desert tortoise in the action area. We have reached this conclusion because grazing would occur on approximately 136,105 acres of the higher quality habitat on which the Bureau has proposed to establish desert wildlife management areas; the desert wildlife management areas proposed by the Bureau would cover approximately 1,023,329 acres. (The acres of higher quality habitat identified in the previous sentence comprise the acreage of critical habitat on public lands within the Ord Mountain Allotment (LaPre 2005j).) Additionally, the intensity at which the Bureau proposes to allow grazing, both within and outside of desert wildlife management areas, should enable desert tortoises to obtain sufficient nutrition.

Effects on Critical Habitat

Livestock would no longer graze in the Gravel Hills, Harper Lake, and Cronese Lakes allotments and in portions of the Superior Valley, Lava Mountain, Shadow Mountain, Cantil Common, Monolith-Cantil, and Stoddard Mountain allotments as a result of actions proposed by the Bureau. Consequently, approximately 718,000 acres of critical habitat of the desert tortoise within the planning area would not be grazed. (The Goldstone Allotment and the remaining portion of the Superior Allotment will also no longer be grazed. These areas will be used for training by the Army; consequently, we did not include the acreage of these areas in the amount of ungrazed habitat.) This decrease will eliminate the direct adverse effects of grazing on the

primary constituent elements of critical habitat. Non-native plant species whose spread across the landscape may have been assisted by grazing will not disappear from desert tortoise critical habitat; however, the potential exists that the removal of livestock may decrease the suitability of areas for invasive species that are already present and assist in preventing the introduction of new exotic species.

The Bureau's proposal to allow voluntary relinquishment of the remaining allotments may further eliminate adverse effects of grazing on the primary constituent elements of critical habitat, if operators opt to pursue this course of action. The establishment of forage thresholds should reduce, to some degree, the adverse effects of grazing on allotments that will be grazed.

Grazing would continue on approximately 110,000 acres of critical habitat. Most of this acreage is located within the Ord Mountain Allotment. The remaining areas of critical habitat that would continue to be grazed are relatively small parcels that are located at the edges of critical habitat units. These parcels, in total, cover approximately 8,000 acres.

We conclude that the grazing program proposed by the Bureau is not likely to compromise the conservation role and function of critical habitat of the desert tortoise in the action area. We have reached this conclusion because grazing would occur on approximately 110,000 acres of critical habitat. At least portions of the grazed areas are located at elevations where some of the primary constituent elements of critical habitat are not found naturally. Most of the critical habitat within the planning area, which totals approximately 1,670,479 acres (Service 2005g), would not be grazed. Additionally, the intensity at which the Bureau proposes to allow grazing within critical habitat should reduce, to some degree, the adverse effects of grazing on the primary constituent elements.

Amendment 9, Public Land Vehicle Access Network

Through adoption of the West Mojave Plan, the Bureau proposes to designate various types of routes as open to vehicular travel within desert tortoise habitat. The route designation process involved two inventories of routes in the western Mojave Desert. The Bureau conducted its initial review of certain regions from 1985 through 1987; the remainder of the routes was reviewed in 2001 and 2002. The following table lists the types and mileages of routes that the Bureau has designated that may affect the desert tortoise; note that only the total mileage of the 1985 – 1987 routes is available (LaPre 2005e).

Types of Routes	Miles of Routes Within Critical Habitat	Miles of Routes Outside of Critical Habitat
Single Track	140	63.4
Jeep Trails, Two-Tracks, etc.	1,539.6	357.8
Washes	59.6	2.2
1985 - 1987 Inventory	491.6	2,809.8
Total	2,230.8	3,233.2

Effects on the Desert Tortoise

As we have previously noted in this biological opinion, vehicle access exposes desert tortoises to numerous threats. Although vehicle strikes may be the most obvious impact, it may not be the most deleterious effect on desert tortoise populations. Open routes allow increased human access into areas where desert tortoises reside; although many of the casual uses associated with open routes do not directly threaten desert tortoises, these routes also provide access for numerous unauthorized activities, such as poaching, vandalism, and cross-country riding.

Limited routes pose the same threats to desert tortoises as open routes; however, because use of these routes is restricted to specific users and uses, the degree of threat is greatly reduced. The Bureau has designated only 30.6 miles of limited routes within desert tortoise habitat in the planning area (LaPre 2005h).

We have also noted previously in this biological opinion that neither the Bureau or the Service have definitive information on the size of a route network that would have such minimal effects on the desert tortoise that its overall conservation would not be affected; obviously, we expect that roadless areas would not adversely affect desert tortoises. The extent that the changes in the access network affect the desert tortoise will be difficult to measure because of the slow reproductive rate of the species and other factors, such as disease, drought, and predation, which may be affecting the number of individuals in a region.

Despite the indirect effects of open routes and lack of the definitive information cited in the preceding paragraph, the route network proposed by the Bureau in the West Mojave Plan should reduce the adverse effects of vehicle use of the desert tortoise for several reasons. First, the amendment proposed by the Bureau would reduce the amount of existing open routes in subregions that overlap critical habitat of the desert tortoise in the western Mojave Desert from approximately 4,062 to 2,475 miles (Coyote, El Mirage, Fremont, Kramer, Newberry-Rodman, Ord, and Superior subregions, plus the Black Mountain, Rainbow Basin, and Western Rand Mountains areas of critical environmental concern). The Bureau et al. (2005) note that, for several subregions, a proportionately higher number of route closures are in areas characterized by bajada topography. Conversely, a proportionately higher number of routes were designated as open in more mountainous terrain. Desert tortoises are generally more abundant on bajadas and valleys than in mountains areas; also, instances of authorized and unauthorized off-road travel would likely occur less frequently in mountainous terrain. Overall, such a network of routes of travel would have fewer adverse effects on desert tortoises than the current network.

The Bureau's proposal to designate approximately 15 miles of new open routes and approximately 20 miles of open routes as competition routes adjacent to the Spangler Hills Off-highway Vehicle Management Area could cause the loss of some desert tortoises in this region. We expect that few desert tortoises would be affected because they generally occur in lower numbers in this area, possibly as a result of previous vehicular activity and its more northerly location. The closure of approximately 35 miles of currently open routes within the Fremont-Kramer Desert Wildlife Management Area to offset the opening of the routes near the Spangler Hills Off-highway Vehicle Management Area should reduce the potential that desert tortoises

will be affected by vehicular use; these closures are in an area that is capable of supporting moderate to high densities of desert tortoises. Overall, this proposal should result in a net benefit to the desert tortoise.

Finally, we note that the proposed action establishes a network of roads that is more extensive than those proposed by the 1985-87 inventory and the interim network that resulted from the settlement agreement with the Center for Biological Diversity. Realistically, however, the route network in the western Mojave Desert at the current time consists of any route that shows evidence of prior use. The proposed alternative would allow vehicle use only on routes marked as open. Clearly, establishing a well-defined system of marked routes would reduce the density of routes and thereby reduce mortality of desert tortoises.

The Bureau also discusses measures to attempt to reduce the effects of open routes on desert tortoises. For example, it cites the current law regarding speed limits on unimproved roads. We note that this law, as described by the Bureau in the final environmental impact report and statement, would be enforced for “the safety of other persons and property.” Because desert tortoises do not fall into that category, current law is likely not enforceable strictly for their protection, particularly much lower speeds are necessary to protect desert tortoises than are generally needed to protect persons and property. Additionally, we expect that the local law enforcement agencies lack the ability to patrol regularly enough to enforce this standard. Therefore, we expect that the enforcement of speed limits on unpaved roads is unlikely to provide substantial protection to desert tortoises.

The final environmental impact report and statement notes that, if monitoring or studies show that certain unimproved roads are causing an increased level of mortality of desert tortoises, the Bureau will consider ways, including speed regulators, to reduce or avoid these effects. This strategy of adaptive management would generally be appropriate; however, many factors render this issue a difficult one to resolve. In the case of desert tortoises in the Western Mojave Recovery Unit, we do not have sufficient baseline data on the level of mortality on unimproved roads to judge whether an increase has occurred. We doubt that the Bureau has sufficient resources to monitor unimproved roads at a level that would provide the baseline and subsequent information, particularly since carcasses in the desert are usually scavenged so quickly that monitors may need to find them almost immediately to ascertain the cause of death with certainty. Additionally, so few desert tortoises remain in some areas of the Western Mojave Recovery Unit that establishing trends may be statistically impossible. Speed may not be the only factor that results in the killing of desert tortoises; small individuals are difficult to see under the best circumstances and large animals may be missed as a vehicle makes a sharp turn or comes over a rise in the road. Finally, we are unaware of any monitoring technology or management strategy that would be effective over such a large area. We again note that the best strategy to protect desert tortoises from vehicles is to separate them from roaded areas to the greatest degree possible.

This action is authorized under the guidance of the California Desert Conservation Area Plan as a casual use and would become effective upon the Bureau’s signing of the record of decision.

Consequently, the Bureau and Service will not consult on this causal use again, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16.

Effects on Critical Habitat

The use of vehicles on roads and trails that are designated as open or limited will not, in general, adversely affect most of the primary constituent elements of critical habitat because these biological and physical attributes are not present within roadbeds. Some roads support annual plants, possibly even at greater local densities than on adjacent, undisturbed habitat, because of alterations in the hydrological regime caused by the road. Although such areas may be of value to a few desert tortoises, they are not so extensive that they substantially alter the patterns of the distribution of forage plants.

Routes have the potential to fragment habitat and interfere with movement, dispersal, and gene flow; this ability to move and disperse is a central tenant of the first primary constituent element of critical habitat of the desert tortoise. Major highways, such as Interstate 15, are sufficiently wide and busy with vehicles that they form a virtually impenetrable barrier to movement of desert tortoises, if underpasses are not available. Unpaved roads that are used infrequently likely do not pose a threat of fragmentation; we are unaware of any dirt road or track within critical habitat of the desert tortoise that is so heavily traveled that movement of desert tortoises would be precluded. Ongoing road maintenance, which is an indirect effect of a route network, can lower the bed of the road and raise berms to a degree that desert tortoises that enter the roadway cannot exit. These animals are subsequently threatened with predation, exposure to extreme temperatures, collection, and collision with vehicles.

The primary effects of open routes on the primary constituent elements of critical habitat stem from the access they provide for unauthorized activities and as a corridor for the spread of invasive plant species. We noted the prevalence of off-road vehicle tracks that were observed on transects previously in this biological opinion; the final environmental impact report and statement contains additional discussion on this issue. Even a few passes by off-road vehicles can disturb and compact substrates, destroy annual plants, and damage shrubs; these features constitute the primary constituent elements of critical habitat. Additionally, a consistent pattern of behavior in the California Desert Conservation Area is that, once someone has driven through an area, other users deem it an appropriate activity; consequently, the damage to the primary constituent elements of critical habitat is exacerbated. Areas that are most heavily used for off-road activity no longer support the primary constituent elements of critical habitat.

Any user of open routes has the ability to spread non-native plants into desert wildlife management areas. As we have discussed previously in this biological opinion, non-native species can compromise the primary constituent element of critical habitat related to the availability of suitable forage species. They can also create large areas of standing dead material that are more likely to burn; these fires subsequently destroy the shrubs that desert tortoises rely on for shelter.

Amendment 10, Stopping and Parking of Motorized Vehicles and Vehicular Camping.

Through adoption of the West Mojave Plan, the Bureau will amend the California Desert Conservation Area Plan to allow camping in association with motorized vehicles in previously existing disturbed camping areas adjacent to motorized vehicle routes designated as open and the stopping and parking of motorized vehicles within 50 feet of the centerline of the designated route in desert wildlife management areas. Outside of desert wildlife management areas, on public lands administered by the Bureau, stopping, parking and camping associated with motorized vehicles must occur within 300 feet of routes designated as open in accordance with existing regulations.

Effects on the Desert Tortoise

Desert tortoises may be killed or injured as a result of camping in association with motorized vehicles in previously existing disturbed areas and stopping and parking within 50 feet of the centerline of routes within desert wildlife management areas in the planning area. Desert tortoises that are crossing or residing in these disturbed areas would be at risk if a vehicle uses the area at the same time the animal is present. Additionally, desert tortoises may enter disturbed areas after the vehicle is parked to take cover in its shade; the desert tortoise could then be crushed if the vehicle moves. The likelihood that desert tortoises would be killed is likely far less in disturbed areas than in undisturbed areas because the drivers of vehicles are likely more able to see animals without the full component of vegetation that is normally present; additionally, desert tortoises are likely to spend less time in these areas because of the more compact substrates and less vegetation available for shelter and forage.

Reducing the distance from the centerline of the road in which vehicles are allowed to stop and park within desert wildlife management areas from 300 to 50 feet should substantially decrease the likelihood that desert tortoises will be killed. Within the Fremont-Kramer, Superior-Cronese, and Ord-Rodman desert wildlife management areas, the area that is potentially available to stop and park will be reduced from approximately 124,372 to 23,117 acres (page 4-116 of the final environmental impact report and statement). Additionally, as we have noted previously in this biological opinion, the vegetation and terrain in large portions of the desert wildlife management areas will likely preclude the ability of vehicles to leave the designated routes; this factor will also reduce, to some degree, the risk that desert tortoises will be killed.

Outside of desert wildlife management areas, the distance from the centerline of the road that vehicles may stop, park, and camp will remain at 300 feet. Consequently, the risk to desert tortoises will remain unchanged from the current situation. The generally lower densities of desert tortoises outside of desert wildlife management areas is likely to result in relatively fewer animals being killed in these regions of the desert.

Neither we nor the Bureau can provide any quantitative information on how frequently desert users leave routes of travel for these distances to camp, stop, and park either within or outside of desert wildlife management areas. The final environmental impact report and statement notes that 77 of 100 staging areas, 931 of 1,369 camping areas, and 28 of 37 trailheads detected during field work in 2001 and 2202 were located within 100 feet of designated routes; it did not provide any further information on sites located between 50 to 300 feet from the road; consequently, we cannot determine the extent to which the proposed action will change the use of these areas.

This action is authorized under the guidance of the California Desert Conservation Area Plan as a casual use and would become effective upon the Bureau's signing of the record of decision. Consequently, the Bureau and Service will not consult on this causal use again, unless the agencies determine that re-initiation of consultation is required, as described at 50 *Code of Federal Regulations* 402.16.

Effects on Critical Habitat

The primary constituent elements of critical habitat are not likely to be affected to a substantial degree as a result of camping in association with motorized vehicles in previously existing disturbed areas because the value of the biological and physical attributes in such areas is likely already degraded. Stopping and parking within 50 feet of the centerline of routes within desert wildlife management areas in the planning area will adversely affect the primary constituent elements of critical habitat by compacting and disturbing substrates and crushing annual plants and possibly shrubs. The quantity of plants and substrates that are that affected is likely to be minor, in comparison to the amount of annual plants and substrates available within the desert wildlife management areas. The most deleterious effect to critical habitat may result from an acceleration of the spread of invasive plant species.

Reducing the distance from the centerline of the road in which vehicles are allowed to stop and park within desert wildlife management areas from 300 to 50 feet would substantially decrease the amount of critical habitat that could be affected by this activity. As we mentioned in the previous section of this biological opinion, the area that is potentially available to stop and park will be reduced from approximately 124,372 to 23,117 acres within the Fremont-Kramer, Superior-Cronese, and Ord-Rodman desert wildlife management areas (page 4-116 of the final environmental impact report and statement).

Because the boundaries of the critical habitat units and desert wildlife management areas do not entirely overlap, approximately 20.1 miles of routes are located on public lands within critical habitat units but outside of desert wildlife management areas (Pratini 2005). The following table depicts the approximate acreage of critical habitat that is open to stopping and parking. Note that, because the desert wildlife management areas are generally larger than the critical habitat units, the acreages depicted in the "Acreage of Area Open to Stopping and Parking - Within Desert Wildlife Management Areas" likely overestimate the size of areas that are open for stopping and parking.

Critical Habitat Unit	Total Acreage	Acreage of Public Lands	Acreage of Area Open to Stopping and Parking		
			Within Desert Wildlife Management Areas	Outside of Desert Wildlife Management Areas But Within Critical Habitat ¹	Total Within Critical Habitat
Superior-Cronese	772,000	380,592	9,833	260	10,093
Fremont-Kramer	518,000	283,710	10,138	43	10,181
Ord-Rodman	254,142	202,845	3,146	497	3,643
Pinto Mountain	171,700	103,771	Unavailable	573	Unavailable
Totals	1,715,842	970,918	23,117	1,373	23,917

¹ From Pradini 2005.

As the preceding table indicates, relatively minor portions of the critical habitat units are open to stopping and parking. The primary constituent elements of critical habitat will not be disturbed by these activities within the large portions of the critical habitat units that will not be opened to stopping and camping. Additionally, the Bureau's current guidance allows drivers to stop, park, and camp within 300 feet of the route. Under this policy, most people use existing disturbed areas and do not drive through areas with vegetation (Beck and Ahrens pers. comms. 2005); recreational users tend to use disturbed areas at least partially to avoid damage to their vehicles. Finally, as we have noted previously in this biological opinion, the vegetation and terrain in large portions of the critical habitat units will likely preclude the ability of vehicles to leave the designated routes. These factors will also reduce, to some additional degree, the areas in which the primary constituent elements of critical habitat are likely to be disturbed by these activities. Consequently, the Bureau's proposal to allow stopping and parking within approximately 23,917 acres of critical habitat within the planning area is not likely to compromise the conservation role and function of these critical habitat units.

Miscellaneous Actions, Johnson Valley to Parker Race Corridor

The Bureau proposes to retain the Johnson Valley to Parker race corridor, which passes along the southeastern edge of the Ord-Rodman Desert Wildlife Management Area and the Ord-Rodman Critical Habitat Unit.

Effects to the Desert Tortoise

Desert tortoises are present in at least medium densities in this reach of the corridor; desert tortoises could potentially be killed during any event that is held when they are active. Densities of desert tortoises decline to the east of the Pisgah Crater area; therefore, desert tortoises are less likely to be directly affected by races in that area. In areas that contain sensitive resources, such as the relatively greater numbers of desert tortoises near Pisgah Crater, the Bureau would impose "yellow flag" conditions, which could include speed limits, rules concerning passing, and other measures to avoid or reduce impacts (LaPre 2005g); these measures should reduce, to some degree, the potential mortality of desert tortoises.

The Bureau will consider whether to authorize individual events when they are proposed by applicants. Consequently, it will consult with the Service, under the auspices of section 7(a)(2) of the Act, as appropriate if an event is proposed.

Effects on Critical Habitat

Because of the way the Service drew the boundaries of the Ord-Rodman Critical Habitat Unit, the race corridor will be located slightly within its boundaries. The Bureau proposes to limit use of this race corridor to designated open routes. Consequently, vehicles will not travel off of established roads and, therefore, will not disturb the primary constituent elements of critical habitat to a substantial degree. We expect that any straying of riders off of the road will be minimal. To the degree that riders do stray, some disturbance of the primary constituent elements of critical habitat would likely occur, in the form of compacted and disturbed substrates and damaged annual plants and shrubs. Given that we expect this disturbance to be confined to the immediate vicinity of the open route and to be very minor in extent relative to the size of the critical habitat unit, we do not expect that the occasional straying of riders from the road will compromise the function of the critical habitat unit.

Summary of the Effects of the California Desert Conservation Area Plan, as Amended, on the Desert Tortoise and its Critical Habitat

Effects on the Desert Tortoise

The proposed amendment of the California Desert Conservation Area Plan for the Western Mojave Recovery Unit would increase protection of the desert tortoise above the current management situation that occurs within this region. Additionally, except for casual uses (e.g., casual mining exploration, vehicle use on existing roads, hiking, and vehicle camping along existing roads) and ongoing grazing, activities and projects will receive site-specific environmental review and consultation with the Service, pursuant to section 7(a)(2) of the Act, as appropriate. Therefore, all activities and projects, except casual uses, may be denied, modified, or mitigated to reduce adverse effects to desert tortoise if, as proposed for some future specific activity, they would violate section 7(a)(2) of the Act. As we have noted previously in this biological opinion, section 6840 of the Bureau of Land Management Manual states that the Bureau's policy is to "ensure that (its) actions will not reduce the likelihood of survival and recovery of any listed species or destroy or adversely modify their critical habitat."

This biological opinion also addresses specific actions that were adopted as part of the West Mojave Plan to implement various aspects of the recovery plan for the desert tortoise. The following discussion summarizes important components of the West Mojave Plan and its effects on the desert tortoise.

The Bureau's proposal to designate all lands within desert wildlife management areas as Class L should provide increased protection to the desert tortoise over that currently provided by Class M guidance; however, the Bureau can authorize actions within Class L areas that could kill desert tortoises. The proposal to limit the cumulative amount of ground disturbance to one percent

should ensure that the vast majority of desert tortoises residing on public lands within the desert wildlife management areas are conserved in a manner that provides for their survival and recovery.

The designation of routes in desert wildlife management areas, with an overall reduction in the amount of the road network, should reduce the level of mortality of desert tortoises on roads; it should also reduce the area in which they are threatened by other human activities related to access (e.g., poaching, vandalism). Neither the Bureau nor the Service has definitive information on how differing route networks affect the desert tortoise. Roadless areas would have the least adverse effect on desert tortoises; an access network that provides for large expanses of undisturbed habitat for the desert tortoise would seem to provide the opportunity for recovery. The extent that the changes in the access network affect the desert tortoise will be difficult to measure because of the slow reproductive rate of the species and other factors, such as disease, drought, and predation, which may be affecting the number of individuals in a region.

The desert tortoise will benefit from the Bureau's proposal to allow the voluntary relinquishment of grazing leases and related authorizations; cattle have been removed from several allotments and sheep have not grazed substantial areas of critical habitat since it was designated. As a result of this action, only one cattle allotment remains within a desert wildlife management area in this bioregion; desert tortoises will be threatened with trampling and crushing by cattle and operators on a far smaller area.

Reducing the distance that cars and trucks can drive and park from up to 300 feet from a route of travel to 50 feet in the desert wildlife management areas provides a greater degree of protection to the desert tortoise. The requirement that camping be limited to existing disturbed areas provides an additional level of protection.

Maintaining a corridor for competitive events along the Johnson Valley to Parker route is likely to kill or injure desert tortoises. We do not have sufficient information to assess the likely level of mortality at this time. The Bureau's review of a specific proposed race in the future will provide an opportunity to review the potential level of mortality in adequate detail. We note that the Bureau eliminated the western fragment of the corridor for the Barstow to Las Vegas race course; this action eliminates a potential threat to desert tortoises.

The Bureau has proposed to withdraw several areas from mineral location and entry. This action has the potential to reduce to a substantial degree the number of desert tortoises that may be killed during casual use and under future plans of operation.

The acquisition of private lands within desert wildlife management areas will remove at least some threats that desert tortoises may face on non-federal lands; this acquisition will also facilitate the Bureau's management. The addition of lands to the retention zone in the West Mojave Land Tenure Adjustment Program will increase the area within which desert tortoises may be conserved.

Programs to educate visitors about the desert tortoise and how they can assist in conserving the species will also promote recovery of the species. A permitting and education program for use of vehicles in the Rand Mountains may be particularly beneficial, given the difficulty that the Bureau has had in enforcing compliance with the route network in this area.

The California Desert Conservation Area Plan, as amended by the West Mojave Plan, provides guidance, including the requirement to consider the needs of listed species, sufficient to ensure the survival and recovery of the desert tortoise in the Western Mojave Recovery Unit. The decline in this region prompts concern; desert tortoise numbers are low enough in certain areas to make them almost undetectable. Full and swift implementation of the amended California Desert Conservation Area Plan may reduce the severity and duration of the decline, if it is tied to anthropogenic causes.

In summary, the actions in the West Mojave Plan were proposed with consideration of the Bureau's mandates to manage public lands and after careful evaluation of the current situation in these areas and input from the public and numerous agencies. With a few exceptions, such as the Johnson Valley-to-Parker race corridor and permitting vehicles to stop and camp off of routes, the actions that were adopted by the Bureau are highly protective of desert tortoises. Even the exceptions as noted provide greater protection to the desert tortoise than the California Desert Conservation Area Plan of 1980. In addition, as we discussed previously in this biological opinion, the best data available seem to indicate that none of these actions have severe adverse effects on the desert tortoise. However, the cause of the recent declines in the number of desert tortoises across California has not been identified. Consequently, the mechanisms needed to reverse these declines are also unknown. The potential exists that reversal of the decline of the desert tortoise may require substantial additional management; another scenario is that we may not be able to identify or manage the agent or agents responsible for the decline.

Effects on Critical Habitat

The proposed amendment of the California Desert Conservation Area Plan for the Western Mojave Recovery Unit would improve management of critical habitat of the desert tortoise above the current management situation that occurs within this region. Additionally, except for casual uses (e.g., casual mining exploration, use of open wash zones, vehicle use on existing roads, ongoing grazing, hiking, and vehicle camping along existing roads), activities and projects will receive site-specific environmental review and consultation with the Service, pursuant to section 7(a)(2) of the Act. Therefore, all activities and projects, except casual uses, may be denied, modified, or mitigated to reduce adverse effects to the primary constituent elements of critical habitat if, as proposed for some future specific activity, they would violate section 7(a)(2) of the Act. As we have noted previously in this biological opinion, section 6840 of the Bureau of Land Management Manual states that the Bureau's policy is to "ensure that (its) actions will not reduce the likelihood of survival and recovery of any listed species or destroy or adversely modify their critical habitat."

This biological opinion also addresses specific actions that were adopted as part of the West Mojave Plan to implement various aspects of the recovery plan for the desert tortoise. The

following discussion summarizes important components of the bioregional plans and their effects on critical habitat of the desert tortoise.

The Bureau's proposal to designate all lands within desert wildlife management areas as Class L should provide increased protection to critical habitat over that currently provided by Class M guidance. Not all critical habitat was included within desert wildlife management areas; however, even without the portions of critical habitat that have been omitted from desert wildlife management areas, the Bureau has included sufficient areas of critical habitat to ensure the conservation role and function of the critical habitat units in the planning area for the Western Mojave Recovery Unit.

The Bureau can authorize actions within Class L areas that could degrade or remove primary constituent elements of critical habitat. The proposal to limit the cumulative amount of ground disturbance to one percent should ensure that the vast majority of public lands within the critical habitat units is managed for the conservation of the desert tortoise.

The designation of routes within the boundaries of the critical habitat units, with an overall reduction in the amount of the road network, should reduce adverse effects to the primary constituent elements of critical habitat. The closure of 117 miles of navigable washes within desert wildlife management areas will reduce the adverse effects to a great degree.

Maintaining a corridor for competitive events along the Johnson Valley-to-Parker route is not likely to disturb, to a substantial degree, the primary constituent elements of critical habitat where the route borders the Ord-Rodman Critical Habitat Unit because the Bureau will require riders to remain on the designated route. The elimination of the Barstow to Vegas race corridor may have a slight benefit to critical habitat, in that vehicles will no longer have the potential for to stray off of the established route.

Reducing the distance that cars and trucks can drive and park from up to 300 feet from a route of travel to 50 feet within large portions of the critical habitat units in the planning area provides a greater degree of protection to the primary constituent elements of critical habitat of the desert tortoise. The additional requirement to limit camping to existing disturbed areas provides even a higher degree of protection because it restricts this activity to areas that usually lack one or more of the primary constituent elements of critical habitat of the desert tortoise.

The voluntary relinquishment of grazing leases and related authorizations will substantially reduce the effects of cattle and sheep grazing on the primary constituent elements. Cattle have been removed from several allotments and sheep have not grazed substantial areas of critical habitat since it was designated.

The acquisition of private lands within desert wildlife management areas will remove at least some sources of degradation of the primary constituent elements of critical habitat of the desert tortoise that occur on non-federal lands; this acquisition will also facilitate the Bureau's management. The addition of lands to the retention zone in the West Mojave Land Tenure

Adjustment Program will increase the area of critical habitat on which desert tortoises may be conserved.

Programs to educate visitors about how to behave responsibly while visiting areas of critical habitat will also promote conservation of the desert tortoise. A permitting and education program for use of vehicles in the Rand Mountains may be particularly beneficial, given the difficulty that the Bureau has had in enforcing compliance with the route network in this area; if vehicles remain on designated routes, the impacts to the primary constituent elements of critical habitat would be substantially reduced.

In summary, the California Desert Conservation Area Plan, as amended by the West Mojave Plan, provides guidance, including the requirement to consider the needs of listed species, sufficient to ensure the conservation role and function of critical habitat of the desert tortoise in the Western Mojave Recovery Unit. Additionally, the specific actions that were adopted by the Bureau are highly protective of critical habitat. The best data available seem to indicate that the few exceptions to this statement, such as permitting vehicles to stop and camp off of routes, are not likely to have severe adverse effects on the overall function of affected critical habitat units; in these cases, the scale of the impact is minor in comparison with the area of critical habitat. Although recent declines in the numbers of desert tortoises in several regions of the desert prompt concern, we have not been able to attribute those declines in a definitive manner to changes in the condition of desert tortoise habitat.

Any consideration of the effects of an action on a species must consider the scale of those effects; that is, how much of the species' range would be degraded or enhanced by the proposed action. The range, recovery units, and critical habitat units of the desert tortoise encompass vast areas. The scale of the California Desert Conservation Area Plan is also vast. Its goal is to provide for the use of public lands and resources in a manner that enhances, where possible, and does not diminish, on balance, the environmental, cultural, and aesthetic values of the desert and its productivity (Bureau 1999). The immensity of the range of the desert tortoise and the large amount of critical habitat assist in achieving this balance. Although the Bureau has authorized many projects under the guidance of the California Desert Conservation Area Plan, large expanses of habitat, including most critical habitat of the desert tortoise, remain undisturbed by the Bureau's management actions. In our analysis, we place particular emphasis on the Bureau's commitment to ensure that no more than one percent of land within the desert wildlife management areas under its management will be disturbed by future actions; this measure should ensure that the conservation role and function of critical habitat of the desert tortoise are maintained.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The County of San Bernardino is processing applications for several projects that would be located within habitat of the desert tortoise in the western Mojave Desert (Sansonetti 2004). These potential projects include: the placement of billboards adjacent to Interstate 15 in the Yermo-Harvard area and Interstate 40 in the Newberry Springs area; commercial uses along Interstates 15 and 40 in the Yermo and Newberry Springs areas; the expansion of St. Anthony's Monastery north of Interstate 15 in the Harvard area; and an industrial center west of Interstate 15 north of Victorville and east of the Mojave River.

The placement of billboards adjacent to the interstates is unlikely to result in the loss of desert tortoises because they are generally not abundant near freeways. We expect the amount of habitat loss to be minimal because of the nature of the projects; additionally, habitat near freeways is often severely degraded by various human activities.

The development of commercial facilities along Interstates 15 and 40 in the Yermo and Newberry Springs areas is more likely to cause loss of individuals and habitat of the desert tortoises. These facilities, however, would likely be developed adjacent to freeways and near existing commercial uses; therefore, we expect that the impacts to the desert tortoise and its habitat would be minimal and would have only minor effects on the viability of the Superior-Cronese and Ord-Rodman desert wildlife management areas.

The development of an industrial center north of Victorville may also kill individuals and destroy habitat of the desert tortoise. This area, however, is not within critical habitat of the species or a desert wildlife management area; consequently, the loss of the few desert tortoises that may reside in this area and the habitat that supports them is unlikely to appreciably reduce the ability of the species to survive and recover.

All of these projects have some potential to provide subsidies to common ravens, which, as we have mentioned previously in this biological opinion, prey on juvenile desert tortoises. This increase in subsidies may result in slightly greater numbers of common ravens.

Planners for the County of Kern reported that they did not have any projects that met our definition of cumulative effects (Oviatt 2004). The County of Inyo is not considering any proposed actions within the range of the desert tortoise (Smith pers. comm. 2004). The Bureau does not manage land in Los Angeles County that supports the desert tortoise; consequently, we consider Los Angeles County to be outside the action area of this consultation.

CONCLUSIONS

Desert Tortoise

After reviewing its current status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to jeopardize the continued existence of the desert tortoise.

We reached this conclusion for two reasons. First, although the number of desert tortoises has declined within the action area of this consultation, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan will ensure that actions the Bureau takes, funds, and authorizes are not likely to reduce appreciably, either directly or indirectly, its reproduction, numbers, or distribution in the action area; additionally, we did not detect any cumulative effects that would substantially alter the status of the desert tortoise in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the desert tortoise and to further its conservation. These measures include, but are not limited to:

- The establishment of large, well-distributed desert wildlife management areas that will be administered in a manner consistent with most of the recommendations of the recovery plan for the desert tortoise and will promote the survival and recovery of the species within this portion of its range;
- The designation of all lands within desert wildlife management areas as Class L, which will provide increased protection to the desert tortoise over that currently provided by Class M;
- Substantial reductions in the amount of livestock grazing to the degree that most desert tortoises and their habitat in these planning areas will not be exposed to cattle or sheep grazing;
- Acquisition of private lands, which will result in a higher level of protection of desert tortoises under the guidance of the California Desert Conservation Area Plan;
- The addition of lands to the retention zone in the West Mojave Land Tenure Adjustment Program, which will increase the area within which desert tortoises may be conserved;
- A limit of one percent of new disturbance within desert wildlife management areas to reduce the loss of desert tortoises, which will ensure that most individuals and their habitat in areas that are essential to their conservation will not be exposed to the adverse effects of human activities;
- A reduction in the distance, in the desert wildlife management areas, from the centerline of roads that vehicles can stop and park from 300 feet to 50 feet, which will reduce the likelihood that desert tortoises will be killed;
- Reducing the places, in the desert wildlife management areas, where vehicles can camp to disturbed areas within 50 feet of the road, which will reduce the likelihood that desert tortoises will be killed;

- The withdrawal of several areas from mineral location and entry, which has the potential to reduce to a substantial degree the number of desert tortoises that may be killed during casual use and under future plans of operation; and
- Closure of routes, which will reduce the exposure of desert tortoises to human-related threats; and

Critical Habitat

After reviewing the current status of critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to destroy or adversely modify the critical habitat of the desert tortoise.

We reached this conclusion for two reasons. First, although we are aware of areas within the action area of this consultation where the condition of critical habitat has been degraded to some degree because one or more of the primary constituent elements have been disturbed by human activities, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan will ensure that the condition of critical habitat of the desert tortoise will generally improve or remain functional and continue to serve its conservation role; additionally, we did not detect any cumulative effects that would substantially alter the status of critical habitat of the desert tortoise in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the critical habitat of the desert tortoise and to further the proper functioning of the primary constituent elements. These measures include, but are not limited to, the following actions and proposals:

- The establishment of large, well-distributed desert wildlife management areas encompassing most of the critical habitat in these planning areas that will be administered in a manner consistent with most of the recommendations of the recovery plan for the desert tortoise within this portion of its range;
- Substantial reductions in the amount of livestock grazing to the degree that most critical habitat in these planning areas will not be exposed to grazing activities;
- The designation of all lands within desert wildlife management areas as Class L, which will facilitate management of critical habitat of the desert tortoise to a greater degree than that currently provided by Class M;
- Acquisition of private lands, which will result in a higher level of protection for critical habitat under the guidance of the California Desert Conservation Area Plan;

- The addition of lands to the retention zone in the West Mojave Land Tenure Adjustment Program, which will increase the area of critical habitat that will be managed by the Bureau;
- A limit of one percent of new disturbance within desert wildlife management areas, which will ensure that most critical habitat in these areas will not be exposed to the adverse effects of human activities;
- Reducing the distance from the centerline of the road, in the desert wildlife management areas, that vehicles can stop and park from 300 feet to 50 feet, which will ensure that most critical habitat will not be exposed to the adverse effects of off-road vehicle use;
- Reducing the places, in the desert wildlife management areas, where vehicles can camp to disturbed areas within 50 feet of the road, which will reduce the area that may be subject to off-road vehicle use; and
- The withdrawal of several areas from mineral location and entry, which will reduce, to a substantial degree, the area of critical habitat that may be disturbed during casual use and under future plans of operation.

BIOLOGICAL OPINION FOR PARISH'S DAISY AND ITS CRITICAL HABITAT

STATUS OF THE PARISH'S DAISY AND ITS CRITICAL HABITAT

Basic Ecology of the Parish's Daisy

Parish's daisy is a small perennial herb of the aster family (Asteraceae) that reaches 4 to 12 inches in height. The simple linear leaves are covered with soft, silvery hairs, giving an overall light green appearance to the plant. Up to 10 solitary flower heads are borne on cauline stalks; ray flowers are deep rose to lavender, disk flowers are yellow, and heads have greyish green and glandular phyllaries. The flowering period is from May through June. Parish's daisy has been confused with fleabane daisy (*Erigeron utahensis*), a plant found on carbonate substrates in the mountains of the Mojave Desert and in Utah, Colorado, and Arizona (59 *Federal Register* 43652).

Pollinator species have not been identified for Parish's daisy (Service 2005b). Based on knowledge of species that pollinate other members of the aster family, bees, butterflies or long-tongued flies are likely candidates. We do not have information on the methods of seed dispersal.

Parish's daisy and the other four species listed in the final rule occur primarily on carbonate substrates. The carbonate belt, which consists primarily of limestone and marble, lies along the north slope of the San Bernardino Mountains from White Mountain east to Terrace Springs and southeast to Tip Top Mountain. Approximately 30,000 acres of carbonate substrate occur in this region. Parish's daisy has the widest geographic distribution of the listed carbonate plant

species; it ranges approximately 35 miles along the carbonate belt from Pioneertown in the east to the northern flanks of White Mountain in the west (67 *Federal Register* 78571).

Status of Parish's Daisy

Parish's daisy was listed as threatened on August 24, 1994 (59 *Federal Register* 43652). The primary threat to this species is loss and degradation of habitat resulting from limestone mining. Secondary threats include roads, off-highway vehicle activity, and grazing.

Eliason (2003b) notes that Parish's daisy is found on approximately 1,073 acres. Approximately 655 acres (61 percent of the known range) occur on Federal lands on which mining claims have been filed; mining claims have not been filed on 99 acres (8 percent) of Federal land where the species occurs. Approximately 270 acres (25 percent) occupied by this species are located on non-federal lands (Forest Service and Bureau 2004). These calculations are based on the amount of occupied habitat within the area covered by the carbonate habitat management strategy; the area occupied by the disjunct occurrence of Parish's daisy near Pioneertown is not included in this acreage figures.

Sanders describes Parish's daisy as "clearly declining" as a result of limestone mining (Olson 2003). However, it is still "among the more common of the carbonate endemics" (Olson 2003).

At the time of listing, the Service reported that Parish's daisy was known from approximately 25 occurrences (Olson 2003); in the draft recovery plan, the Service cited 50 occurrences of the species (Service 1997 in Olson 2003). However, Sanders notes that "many of these probably represent reports of different parts of single populations" (Olson 2003). Most populations are on lands within the San Bernardino National Forest at the east end of the San Bernardino Mountains. A few occurrences are located on Bureau lands in this region; two occurrences are located in the Little San Bernardino Mountains (Olson 2003).

Recovery Plan

The Service (1997) prepared a draft recovery plan for the five listed carbonate endemic plants; we have not prepared a final recovery plan for these species. The Bureau, Forest Service, Service, California Native Plant Society, and several mining interests have prepared a management plan for four of the five listed plant species that occur in carbonate habitat in the San Bernardino Mountains (Olson 2003). This carbonate habitat management strategy will functionally serve as a recovery plan for these species.

The carbonate habitat management strategy was developed by the Forest Service, Bureau, Service, mining companies, claim holders, conservation groups, and landowners to resolve conflicts between mining of carbonate materials and the listed plants that occur on these substrates. It is a voluntary regional strategy to balance mining and recovery of these species. The participants in the planning process intend the carbonate habitat management strategy to be operational for 50 years or more; the reserve system for the carbonate plants will be in place in perpetuity. Land in the reserve system will be acquired with public funds, donations, or

redemption of conservation credits; other lands may be exchanged to facilitate both mining and conservation. The carbonate habitat management strategy should result in the conservation of approximately 75 percent of the occupied habitat of Parish's daisy and approximately 50 to 100 percent of its critical habitat (Service 2005b).

Status of Critical Habitat of the Parish's Daisy

Critical habitat for Parish's daisy was designated on December 24, 2002 (67 *Federal Register* 78570). Unless otherwise noted, all of the information in this section is from the final rule. In this final rule, the Service designated critical habitat for five species of carbonate endemic plants in three separate recovery units. Only one unit, the Northeastern Slope Unit, supports the Parish's daisy and Cushenbury milk-vetch; consequently, we will not discuss the other units in this biological opinion.

The Northeastern Slope Unit includes 115 separate polygons around occurrences of the carbonate plants; it extends from White Mountain at the western edge to Rattlesnake Canyon at the eastern edge, a distance of approximately 25 miles. This unit covers 11,280 acres.

Within the Northeastern Slope Unit, critical habitat for Parish's daisy covers 2,231 acres managed by the Forest Service and 940 acres of Bureau lands; 270 acres are owned by non-federal entities. Approximately 2,771 acres of the lands managed by Federal agencies have been claimed under the provisions of the General Mining Law of 1872 (Forest Service and Bureau 2004).

The final rule for designation of critical habitat of the carbonate plants states that every occurrence is important to maintain the natural population dynamics of local extirpation and colonization events that are necessary for the conservation of the species, as a seed source to colonize unoccupied sites and maintain an equilibrium between colonization and extirpation events, and, potentially, to provide important genetic material through cross pollination and seed dispersal, which may help maintain genetic diversity and reduce the likelihood of extirpation. Habitat components that are essential for each of the five carbonate plants are primarily found in, but not limited to, pinyon woodland, pinyon-juniper woodland and forests, Joshua tree woodland, white fir forests, subalpine forest, canyon live oak woodlands and forests, and blackbush scrub vegetation communities in the San Bernardino Mountains. These habitat components likely provide for: individual and population growth, including sites for germination, pollination, reproduction, pollen and seed dispersal, and seed dormancy; areas that allow for and maintain gene flow between localized occurrences through pollinator activity and seed dispersal mechanisms; areas that provide basic requirements for growth such as water, light, minerals; and lands that support pollinators and seed dispersal vectors.

The Service identified numerous factors, based on research conducted by several workers, as important to the conservation of the five carbonate plants or narrow endemic plants in general: the conservation and management of existing populations; the conservation and management of suitable habitat that is not known to be currently occupied to maintain natural equilibrium between local extirpation and colonization; the protection and maintenance of upslope or

upstream geologic features that provide the necessary materials to replace the soils continually lost to natural processes; conservation and adequate connectivity of undisturbed areas between localized occurrences to allow and maintain gene flow among aggregate occurrences through pollen and seed dispersal vectors; the conservation and maintenance of sites that may allow for pollen and seed dispersal; the conservation of suitable micro-habitat that could be colonized to allow localized occurrences to expand and contract, or maintain normal population dynamics; and the maintenance of normal ecological functions within all localized occurrences. The final rule also notes that the small fragmented range of the five carbonate plants and limiting ecological factors that reduce the chances of their survival make these species particularly vulnerable to natural and human disturbance (e.g., non-native species, wildfire, livestock grazing, forest product harvesting, and mining). (Please see the final rule for citations of the research upon which we based our identification of these factors.)

We identified the specific primary constituent elements for the listed carbonate species to include the physical and biological features that would allow for: space for individual and population growth; food, water, air, light, minerals, or other nutritional or physiological requirements; cover; sites for pollination, reproduction, germination, or seed dispersal and dormancy; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. The final rule notes that all areas designated as critical habitat for the carbonate plants are within their respective historical ranges and contain one or more of the primary constituent elements essential for the conservation of each species; note that each species has specifically defined primary constituent elements. The specific primary constituent elements of critical habitat of Parish's daisy consist of, but are not limited to: soils derived primarily from upstream or upslope limestone, dolomite, or quartz monzonite parent materials that occur on dry, rocky hillsides, shallow drainages, or outwash plains at elevations between 3,842 and 6,400 feet; soils with intact, natural surfaces that have not been substantially altered by land use activities (e.g., graded, excavated, re-contoured, or otherwise altered by ground-disturbing equipment); and associated plant communities that have areas with an open canopy cover.

Most of the land bearing carbonate substrates has either been claimed under the authorities of the General Mining Law of 1872 or patented. Three major limestone mines are currently operating on the north slope of the San Bernardino Mountains. A fourth, known as the Partin Mine, is no longer operating. The following paragraphs provide a general description of mining history within habitat of the carbonate plants; we do not have specific information regarding the locations of these affected areas in relation to the polygons designated as critical habitat.

Omya, Inc., operates the White Knob Quarry, which is located on patented lands within the administrative boundary of the San Bernardino National Forest. The average annual production for this operation is 500,000 tons. Mining would be conducted in phases for up to 30 years. As of 2003, disturbance from mining covered approximately 145 acres. Omya plans to apply to the County of San Bernardino for an amendment to its existing plan of operations to allow mining on 10 acres of unoccupied habitat. As part of this amendment, approximately 10 acres of habitat occupied by the carbonate species that are currently permitted for mining will not be mined (Brown pers. comm. 2003). Omya also leases claims covering approximately 360 acres on the

White Knob-White Ridge deposits. Several Silver Creek Placer claims are also leased by Omya. Some access roads to this mine cross lands managed by the Bureau (Foreman pers. comm. 2003). Specialty Minerals operates the Furnace Canyon (16 acres), Marble Canyon (120 acres), and the C-21 (Arctic Canyon and Cushenbury - 80 acres) quarries. The Nett Hill, Gordon, and Bonnicamp quarries are now inactive (Seal pers. comm. 2003). The Furnace Canyon Quarry and the Marble Canyon Quarry occur on both Forest Service and patented land. The average annual production for Specialty Minerals' operation is 800,000 tons. Some access roads cross lands managed by the Bureau (Foreman pers. comm. 2003).

The Mitsubishi Quarry occupies approximately 173 acres; an additional 18 acres are used to stock pile materials. This mine has an annual production of about 2 million tons of limestone (Shumway pers. comm. 2003). The mine is located on Forest Service and private lands.

An unknown number of occurrences of the listed carbonate plant species have been directly affected by these mining activities. Mining at many of the sites on the north slope of the San Bernardino Mountains was initiated prior to the listing of the carbonate species; the oldest mines were developed without any botanical surveys.

ENVIRONMENTAL BASELINE FOR PARISH'S DAISY AND ITS CRITICAL HABITAT

Previous Consultations

To date, we have formally consulted with the Bureau on two occasions regarding Parish's daisy. On September 30, 1999, we issued a biological opinion on the effects on the Parish's daisy of a proposed limestone quarry on Bureau land near Rattlesnake Canyon (1-8-99-F-77, Service 1999a). The plan of operations called for approximately 5 acres of surface disturbance, with an anticipated production of 86,000 tons per year. To date, this quarry has not been developed (Chavez 2003).

In 1993, the Service issued a biological opinion regarding the effects of cattle grazing on the desert tortoise (1-6-92-F-19; Service 1993b); the Rattlesnake Canyon Allotment, which supports Parish's daisy, was one of the allotments considered in that document. Because the carbonate plants were not federally listed at the time of the grazing consultation, the effects of grazing on those species were not addressed.

The Bureau, Forest Service, and Service recently completed formal consultation, pursuant to section 7(a)(2) of the Act, regarding the effects of the carbonate habitat management strategy on the five listed species, including Parish's daisy (Olsen 2003). The Service issued a biological opinion regarding the carbonate habitat management strategy to the agencies on May 2, 2005 (Service 2005b). The Status of the Parish's Daisy and Its Critical Habitat - Recovery Plan section of this biological opinion contains more information on the carbonate habitat management strategy.

Status of Parish's Daisy in the Action Area

Approximately 237 acres within the Carbonate Endemic Plants Research Natural Area support Parish's daisy and are managed by the Bureau (Forest Service and Bureau 2004). This area comprises approximately 23 percent of the 1,024 acres of habitat occupied by this species (Forest Service and Bureau 2004). Most of the occurrences within the action area are at lower elevations than those on Forest Service lands. Consequently, the action area supports a substantial portion of the distribution of Parish's daisy; additionally, the action area supports plants at the lower elevation range of the species that may not be well represented in occurrences on lands managed by the Forest Service. Maintaining plants in a diversity of habitats, such as may occur over a range of elevations, likely captures a greater degree of genetic variation, which is important in conserving a species on the long term.

Only 2 percent of the disturbed area within carbonate habitat (32 of the 1,590 acres) is on lands managed by the Bureau (San Bernardino National Forest GIS database, Eliason pers. comm. 2003a). Currently, few land uses occur in areas occupied by Parish's daisy.

Status of Critical Habitat of Parish's Daisy in the Action Area

Approximately 940 acres (21 percent) of critical habitat of Parish's daisy occur on public lands managed by the Bureau (Forest Service and Bureau 2004). This acreage indicates the size of the polygons of critical habitat, but not the amount of area that contains the primary constituent elements (67 *Federal Register* 78570). Approximately 746 acres of the critical habitat on public lands have been claimed under the provisions of the mining laws (Forest Service and Bureau 2004). We do not have any further information on the condition of critical habitat in the action area; to the best of our knowledge, most of the area of critical habitat has not been disturbed since its designation.

EFFECTS OF THE ACTION ON PARISH'S DAISY AND ITS CRITICAL HABITAT**Methodology**

We used the same methodology to analyze the effects of the proposed action on the Parish's daisy, Cushenbury milk-vetch, and Lane Mountain milk-vetch that we used for the desert tortoise. We will not repeat it here. Additionally, we will not repeat the following sections on the general effects of human activities on listed plant species and their critical habitats for each plant species we discuss.

General Effects of Human Activities on the Listed Plant Species

In this section, we attempted to briefly summarize how various anthropogenic activities could affect the Lane Mountain milk-vetch, Parish's daisy, and Cushenbury milk-vetch. Note that this analysis is general in nature and, unless otherwise noted, is not intended to apply to any specific action that is or may be authorized by the Bureau.

The use and maintenance of roads can affect listed plant species in several ways. Plants that are on or immediately adjacent to roads can be lost or disturbed when vehicles stray from the road during use or maintenance activities. Dust and mud generated by motorized vehicles, whether they are maintaining or using the road, can cover plants and interfere with physiological functions ultimately affecting plant vigor, reproduction, and survival; this impact would be greatest near the road and in areas traversed by numerous roads. Invasive, nonnative plants can be transported into areas along roads. Modifying washes, such as through the use of culverts where roads cross drainages, may alter the manner in which water flows across habitat and thereby change the distribution of individuals of the listed plant species.

Vehicles traveling off of established roads can crush small shrubs or sub-shrubs, such as Parish's daisy, Cushenbury milk-vetch, and Lane Mountain milk-vetch. Vehicles traveling in this manner can also spread seeds of non-native species over great distances.

Hiking and equestrian use can affect Lane Mountain milk-vetch, Parish's daisy, or Cushenbury milk-vetch. The terrain in which these species live is generally accessible on foot, although some portions of the habitat of Parish's daisy and Cushenbury milk-vetch may be too steep for hiking. The primary effect of walking through habitat of these species would be trampling of plants. Equestrian use may also result in trampling. Because these plants occur in habitat that is generally open, people on foot are likely to walk around most individuals. In all cases, seedlings and smaller plants will be more susceptible to trampling. Individuals of Lane Mountain milk-vetch are less likely to be trampled because of their occurrence within shrubs. Hikers and equestrians can spread seeds of non-native species.

Projects that result in ground disturbance can affect Lane Mountain milk-vetch, Parish's daisy, and Cushenbury milk-vetch. These impacts include direct removal of plants and seeds, trampling of plants, changes in hydrology, burial of plants and seeds under overburden and spoils, and interference with pollination and seed dispersal.

Various human activities can spread non-native species; these species can compete with the listed species for nutrients, germination sites, and scarce moisture, and alter the ability of the area to carry wild fires. The species being considered in this biological opinion are not adapted to fire; consequently, fires could result in a substantial loss of individual plants and severely alter the plant community structure within their habitats.

Fragmentation of habitat could result in a decline in the health of the occurrences of the species under consideration in this biological opinion. If the occurrences or portions of the occurrences are separated from one another by habitat that pollinators cannot cross, pollinators may not have adequate access to ensure propagation. At this time, we do not have extensive information on the pollination ecology of these species. Fragmented habitat is also more susceptible to indirect effects, such as dust from roads and other disturbed areas and invasion by non-native species.

The use of herbicides could result in direct mortality of individuals of Lane Mountain milk-vetch, Parish's daisy and Cushenbury milk-vetch. Other pesticides may reduce or eliminate the

populations of pollinators. Both the active ingredient and surfactants may be toxic to individuals of the listed species and pollinators.

General Effects of Human Activities on Critical Habitat of the Listed Plant Species

The final rule for designation of critical habitat for the carbonate plant species describes the specific primary constituent elements of their critical habitat (67 *Federal Register* 78571). We have described the primary constituent elements for both species in their respective “Status of Critical Habitat” sections of this biological opinion. Except for differences in source of the substrates for these two species, the primary constituent elements are similar. Parish’s daisy and Cushenbury milk-vetch occur on steeper slopes than those occupied by Lane Mountain milk-vetch; they also occur at higher elevations. The substrate on which Lane Mountain milk-vetch occurs is derived from granitic base materials; the species grows only where a thin layer of this specific substrate is present. In this regard, the substrate requirements of the carbonate species and Lane Mountain milk-vetch are similar. Although Lane Mountain milk-vetch requires a host shrub in which to grow, the host shrubs generally occur in a situation with an open canopy, similar the third primary constituent element of the carbonate species. Consequently, the effects of any given activity would likely be fairly similar to all three species.

The implementation of the guidelines and elements of the West Mojave Plan can remove, disturb, or fragment habitat of the listed plant species, including the primary constituent elements of critical habitat. We conducted the following analysis by generally using the primary constituent elements as the basis for our discussion.

Note that, regardless of whether a specific area is within the boundaries of critical habitat or critical habitat has not been designated for a species (e.g., Lane Mountain milk-vetch), various activities generally affect the physical and biological attributes of habitat that supports the listed plant species in the same manner. In the analysis that follows and throughout the biological opinion, we discuss how the primary constituent elements of critical habitat of Parish’s daisy and Cushenbury milk-vetch may be affected by various activities. The same principles apply to habitat of Lane Mountain milk-vetch although we did not designate it as critical. Therefore, for example, ground disturbance has the same general effects on habitat of the plant species, regardless of whether that habitat has been designated as critical. For the purposes of this biological opinion, we do not consider the effects on habitat outside of critical habitat in our conclusions regarding any effects to designated critical habitat.

Soils derived primarily from upstream or upslope limestone, dolomite, or quartz monzonite parent materials that occur on dry, rocky hillsides, shallow drainages, or outwash plains at elevations between 3,842 and 6,400 feet (Parish’s daisy); soils derived primarily from the upper and middle members of the Bird Spring Formation and Undivided Cambrian parent materials that occur on dry flats and slopes or along rocky washes with limestone outwash/deposits at elevations between 3,864 and 6,604 feet (Cushenbury milk-vetch). Mining can disturb the primary constituent elements of critical habitat of Parish’s daisy and Cushenbury milk-vetch by removing the soils that constitute this primary constituent element or by covering them with overburden materials; in either case, these soils would no longer be available to the plants.

Removing or covering the thin layer of granitic substrates upon which Lane Mountain milk-vetch grows would have the same effect on this species.

Soils with intact, natural surfaces that have not been substantially altered by land use activities (Parish's daisy and Cushenbury milk-vetch). The use and maintenance of roads can affect the primary constituent elements of listed plant species. Dust and mud generated by motorized vehicles, whether they are maintaining or using the road, can cover the substrates upon which these plant species, including Lane Mountain milk-vetch, depend; this impact would be greatest near the road and in areas traversed by numerous roads. The potential effect of dust and mud from adjacent roads is likely minor when it is considered in light of the relatively small areas of the habitats of these species that are adjacent to roads.

We are unaware of any hiking trails that traverse habitat of Parish's daisy, Cushenbury milk-vetch, or Lane Mountain milk-vetch. The terrain in which these species live is generally accessible on foot, although some portions of the habitat of Parish's daisy and Cushenbury milk-vetch may be too steep for hiking. Walking through habitat of these species could, to some degree, alter the intact, natural surface of the substrate; walking could affect substrate where Lane Mountain milk-vetch occurs in the same manner.

Associated plant communities that have areas with an open canopy cover (Parish's daisy); associated plant communities that have areas with an open canopy cover and little accumulation of organic material on the surface of the soil (Cushenbury milk-vetch). Human activity can cause or exacerbate the spread of invasive, nonnative plants into habitat of listed species. If non-native these plants become abundant in an area, they could interfere with this primary constituent element by filling intershrub spaces and increasing the amount of leaf litter that contributes to the accumulation of organic material on the surface of the soil. Their presence in these intershrub spaces may lead to competition for light, nutrients, and water. Perhaps more importantly, non-native species can alter the ability of the area to carry wild fires. Parish's daisy, Cushenbury milk-vetch, and Lane Mountain milk-vetch are not adapted to fire; consequently, fires could result in a substantial alteration of the plant community structure in areas occupied by these species.

Effects of the West Mojave Plan on Parish's Daisy and its Critical Habitat

The area where Parish's daisy may be affected by the Bureau's proposals includes public lands supporting the species or its critical habitat within the Carbonate Endemic Plants Research Natural Area on the northern slope of the San Bernardino Mountains in the area to the east of Highway 18 and north of the boundary of the San Bernardino National Forest. Figure 2-11 on the final environmental impact report and statement depicts the Carbonate Endemic Plants Research Natural Area. This area is appropriate to consider in this biological opinion because it includes all areas where Parish's daisy occurs within the California Desert Conservation Area; additionally, the Bureau designated the Carbonate Endemic Plants Research Natural Area to include the areas where this species may be found and affected by its activities.

Amendment 1, New Areas of Critical Environmental Concern

The Bureau will designate a 5,169-acre conservation area for the carbonate plant species.

Effects on Parish's Daisy

The management direction provided by the designation of the conservation area will generally benefit Parish's daisy for numerous reasons. The Bureau's application of a mitigation fee to new ground-disturbing activities, acquisition of land within the conservation area, designation of routes, and monitoring of biological resources will benefit Parish's daisy. These actions will likely reduce the amount of disturbance, provide at least a minor source of income for conservation projects, reduce the likelihood that off-road vehicle use will damage plants, and enhance the Bureau's management capabilities by consolidating land ownership.

The Bureau's proposal to adopt a standard of no surface occupancy to prevent undue and unnecessary degradation of lands, under the surface mining regulations, to protect Parish's daisy is another important element of the conservation strategy. As a result of the adoption of this standard, surface disturbance would be prohibited on the 171 acres that support Parish's daisy and that have already been claimed under the provisions of the General Mining Law of 1872. Additionally, the same protections would apply to approximately 66 acres of public lands that support individuals of this species and have not been claimed under the General Mining Law of 1872. (The areas of claimed and unclaimed land are from Forest Service and Bureau 2004.) Private lands that may be acquired will not be opened to mineral entry. Therefore, these actions will prevent loss of individuals of Parish's daisy as a result of mining activities.

The prohibition against harvesting native plants within conservation areas will benefit Parish's daisy because the inadvertent removal of individuals of this species is far less likely to occur if collection of all species is prohibited. Additionally, prohibiting the collection of other plants may have minor beneficial effects on the community of pollinators by removing this impact to their habitat.

Activities such as hiking, bird watching, and photography would likely have minimal impact on Parish's daisy because the level of use would probably be low; additionally, because these plants occur in habitat that is generally open, people on foot are likely to step around most individuals. Equestrian uses may result in some trampling.

Commercial activities, such as commercial filming, could result in the trampling of Parish's daisy, if it occurs in occupied habitat. To the best of our knowledge, little, if any filming occurs within this conservation area. Consequently, such activity is unlikely to cause substantial impacts to Parish's daisy.

The Bureau will attempt to place more law enforcement rangers and maintenance workers in the field and to focus their efforts on the conservation of biological resources. As we noted in our discussion on the desert tortoise, the Bureau's presence in the field is essential. Without

adequate staffing, numerous impacts can occur and cause serious detrimental effects before they are even detected.

The one percent threshold for new ground disturbance will apply in this conservation area. Approximately 238 acres of occupied habitat for Parish's daisy occur on public lands within the habitat conservation area. Because of the one percent threshold, up to approximately 52 acres of this occupied habitat (i.e., one percent of 5,169 acres) may be disturbed. In such a situation, Parish's daisy occurring on the remaining 186 acres of occupied habitat within this area will not be disturbed by project-level activities. We expect that the likelihood is extremely low that all of the 52 acres of disturbance would occur within occupied habitat of Parish's daisy. Consequently, more than 186 acres of habitat occupied by Parish's daisy is likely to be conserved. Additionally, this area currently receives little use and few proposals for development; we expect this situation will continue. For these reasons, we conclude that the general management direction provided by the West Mojave Plan will not appreciably reduce the reproduction, numbers, or distribution of Parish's daisy.

With the exception of casual use, such as hiking, bird watching, equestrian use, and photography, all of the activities described in this section would be subject to future consultations, pursuant to section 7(a)(2) of the Act, as appropriate. We will be better able to determine the effects of specific actions at the time they are proposed.

Effects on Critical Habitat of Parish's Daisy

The management direction provided by the designation of the conservation area will generally reduce the level of threats to the primary constituent elements of critical habitat of Parish's daisy for numerous reasons. For example, the application of a mitigation fee to new ground-disturbing activities will provide at least a minor source of income for projects designed to manage critical habitat. Also, implementation of a one percent limit on new surface disturbance will likely reduce the threat of new disturbance to some degree. Land acquisition in the conservation area will enhance the Bureau's capabilities of managing critical habitat by consolidating land ownership.

The Bureau's proposal to adopt a standard of no surface occupancy to prevent undue and unnecessary degradation of lands, under the surface mining regulations, to protect Parish's daisy is another important element of the conservation strategy. As a result of the adoption of this standard, surface disturbance would be prohibited on 746 acres of critical habitat on public lands that have already been claimed under the provisions of the General Mining Law of 1872. Additionally, the same protections would apply to approximately 194 acres of critical habitat on public lands that have not been claimed under the General Mining Law of 1872. (The areas of claimed and unclaimed land are from Forest Service and Bureau 2004.) Private lands that may be acquired will not be opened to mineral entry. Therefore, these actions will prevent degradation of the primary constituent elements of critical habitat of Parish's daisy as a result of mining activities.

Activities such as hiking, bird watching, equestrian use, and photography would likely have minimal impact on the primary constituent elements of the critical habitat of Parish's daisy for several reasons. First, these activities will not result in the removal of the substrates that are necessary for growth of Parish's daisy. With regard to the second primary constituent element, because the level of use would probably be low, little surface area will likely be disturbed by these activities. Finally, these recreational activities are unlikely to alter, in any substantial manner, the open character of the habitat in which Parish's daisy occurs; consequently, effects to the third primary constituent element of critical habitat are likely to be minor, if any occur at all.

Commercial activities, such as commercial filming, could disrupt the surface of substrates and thereby adversely affect this primary constituent element; the intensity of the impact would depend on the type of the activity. To the best of our knowledge, little, if any filming occurs within this conservation area. Consequently, such activity is unlikely to cause substantial impacts to Parish's daisy.

The one percent threshold for new ground disturbance will apply in this conservation area. Approximately 729 acres of critical habitat of Parish's daisy occur on public lands within the conservation area (Bureau 2005b). Because of the one percent threshold, up to approximately 52 acres of this occupied habitat may be disturbed. Consequently, the remaining 677 acres of critical habitat of Parish's daisy within this area will not be disturbed by project-level activities. We expect that the likelihood is extremely low that of all of the 52 acres of disturbance would occur within critical habitat of Parish's daisy. Consequently, more than 677 acres of critical habitat is likely to be conserved. Additionally, this area currently receives little use and few proposals for development; we expect this situation will continue. Note that not all the areas within the boundaries of the critical habitat subunits support the primary constituent elements of critical habitat; consequently, the potential also exists that some disturbances within the boundaries of critical habitat may not affect its conservation role and function.

Approximately 211 acres of critical habitat of Parish's daisy occur outside of the boundaries of the conservation area. Critical habitat outside of the conservation area may be at greater risk of disturbance because it will not be subject to the one percent limit on new disturbance or managed at the same level of protection. The maximum amount of critical habitat of Parish's daisy on Bureau lands that may be lost under the provisions of the West Mojave Plan would be 263 acres (i.e., 52 acres within the conservation area, plus 211 acres of critical habitat outside of the boundaries of the conservation area).

Under the worst case scenario described in the Carbonate Habitat Management Strategy for Parish's daisy, approximately 2,357 acres of the total of 4,420 acres of critical habitat would be set aside; this figure includes the area of critical habitat on both Forest Service and Bureau lands. Consequently, the upper limit of disturbance of critical habitat of Parish's daisy that could occur under the direction of the West Mojave Plan would constitute approximately 8.9 percent of the total area of critical habitat that is the minimum to be set aside under the provisions of the Carbonate Habitat Management Strategy. We note that this analysis is doubly conservative because we used the upper limits of disturbance on public lands and the lowest estimate of critical habitat set aside on a range wide basis to arrive at this percentage. Consequently, under

the worst case scenario, approximately 91 percent of designated critical habitat would not be subject to disturbance. For this reason, we conclude that the general management direction provided by the West Mojave Plan will not compromise the conservation role and function of critical habitat of Parish's daisy.

With the exception of casual use, such as hiking, bird watching, equestrian use, and photography, all of the activities described in this section would be subject to future consultations, pursuant to section 7(a)(2) of the Act, as appropriate. We will be better able to determine the effects of specific actions on the primary constituent elements of critical habitat at the time they are proposed.

Amendment 3, Changes in Multiple-use Class Designations

The Bureau proposes to change the multiple-use class designations from Class M to Class L on 4,393 acres on the north slope of the San Bernardino Mountains within the Carbonate Endemic Plants Area of Critical Environmental Concern.

Effects on Parish's Daisy

This action will benefit Parish's daisy because designation of the areas as Class L limits, to a certain degree, the amount of development activity that may occur. We recognize that all development is not prohibited on Class L lands. Our previous biological opinion on the California Desert Conservation Area Plan evaluated the program direction provided by the Bureau's land use classification; we will not repeat that analysis herein. As we noted previously in this biological opinion, specific future actions that the Bureau proposes under the Class L designation will be subject to the consultation requirements of section 7(a)(2) of the Act, as appropriate.

Effects on Critical Habitat of Parish's Daisy

The change proposed by the Bureau will promote the conservation role and function of critical habitat by including these portions of critical habitat in areas that will be managed under the guidelines of Class L, because, as we have stated previously in this biological opinion, these guidelines provide a greater emphasis on the conservation of natural resources than other land use classes (with the exception of Class C) and the one percent limit on surface disturbance associated with desert wildlife management areas and habitat conservation areas will apply. Specific future actions the Bureau proposes under the Class L designation that may affect critical habitat of Parish's daisy will be subject to the consultation requirements of section 7(a)(2) of the Act, as appropriate.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section

because they require separate consultation pursuant to section 7 of the Act. The County of San Bernardino did not identify any actions that are reasonably certain to occur within the action area (Sansonetti 2005).

CONCLUSIONS

Parish's Daisy

After reviewing its current status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to jeopardize the continued existence of Parish's daisy.

We reached this conclusion for two reasons. First, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan will ensure that actions the Bureau takes, funds, and authorizes are not likely to reduce appreciably, either directly or indirectly, the reproduction, numbers, or distribution of Parish's daisy; additionally, we did not detect any cumulative effects that would substantially alter the status of Parish's daisy in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the Parish's daisy and to further its conservation. These measures include, but are not limited to:

- The establishment of an area of critical environmental concern that will be managed in a manner that will promote the survival and recovery of the species within this portion of its range;
- The designation of all lands within the area of critical environmental concern as Class L, which will provide increased protection to Parish's daisy over that currently provided by Class M;
- Removal of livestock grazing from habitat occupied by Parish's daisy;
- Acquisition of private lands, which will result in a higher level of protection of Parish's daisy under the guidance of the California Desert Conservation Area Plan;
- A limit of one percent of new disturbance within the area of critical environmental concern to reduce the loss of Parish's daisy, which will ensure that most individuals will not be exposed to the adverse effects of human activities; and
- The adoption of a no surface occupancy standard within the area of critical environmental concern, which will eliminate the loss of Parish's daisy as a result of mining activities.
- Designation of all routes of travel within the area of critical environmental concern as limited use.

Critical Habitat

After reviewing the current status of critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to destroy or adversely modify the critical habitat of Parish's daisy.

We reached this conclusion for two reasons. First, although the condition of critical habitat within some portions of the action area of this consultation has been degraded to a degree because one or more of the primary constituent elements have been disturbed by past human activities, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan are compatible with the function of critical habitat of Parish's daisy; additionally, we did not detect any cumulative effects that would alter the status of critical habitat of Parish's daisy in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the critical habitat of Parish's daisy and to further the proper functioning of the primary constituent elements. These measures include, but are not limited to, the following actions and proposals:

- The establishment of an area of critical environmental concern encompassing most of the critical habitat of Parish's daisy and its management in a manner that will promote the survival and recovery of the species within this portion of its range;
- Removal of livestock grazing from critical habitat;
- The designation of all lands within the area of critical environmental concern as Class L, which will facilitate management of critical habitat of Parish's daisy to a greater degree than that currently provided by Class M;
- Acquisition of private lands, which will result in a higher level of protection for critical habitat under the guidance of the California Desert Conservation Area Plan;
- A limit of one percent of new disturbance within the area of critical environmental concern, which will ensure that most critical habitat in these areas will not be exposed to the adverse effects of human activities; and
- The adoption of a no surface occupancy standard within the area of critical environmental concern, which will eliminate disturbance to or loss of the primary constituent elements of critical habitat of Cushenbury milk-vetch as a result of mining activities.
- Designation of all routes of travel within the area of critical environmental concern as limited use.

BIOLOGICAL OPINION FOR CUSHENBURY MILK-VETCH
AND ITS CRITICAL HABITAT

STATUS OF THE CUSHENBURY MILK-VETCH AND ITS CRITICAL HABITAT

Basic Ecology of Cushenbury Milk-vetch

Cushenbury milk-vetch is a small, silvery-white, annual to sometimes perennial herb in the pea family (Fabaceae). The slender stems are decumbent, grow to 12 inches in length, and support leaves consisting of 5 to 9 small leaflets. The pink-purple flowers, which bloom from March to May, occur in 5- to 14-flowered terminal racemes, have banner petals reaching up to 0.5 inch long, and develop 8- to 11-seeded fruits (pods). The pods are up to 0.14 inch wide, crescent shaped with three sides and two chambers, which become papery in maturity. Unless otherwise noted, the information in this section is from the final rule for designation of critical habitat for the carbonate plants (67 *Federal Register* 78570). (Please see the final rule for additional citations regarding information on Cushenbury milk-vetch.)

Given the flower shape and color, small bees are the most likely pollinators; we do not know if this species is self-compatible (Olson 2003). We also do not have information on seed bank dynamics (Olson 2003).

Cushenbury milk-vetch is not as widely distributed as Parish's daisy. Cushenbury milk-vetch occurs along the 11-mile long region from Dry Canyon east to Terrace Springs; its range then stretches southeast 6 miles to approximately 1 mile east of Granite Spring. It is currently found on approximately 1,201 acres (Forest Service and Bureau 2004).

Status of Cushenbury Milk-vetch

Cushenbury milk-vetch was listed as endangered on August 24, 1994 (59 *Federal Register* 43652). The primary threat to this species is loss and degradation of habitat resulting from limestone mining. Approximately 1,023 acres (85 percent of the known range) occurs on Federal lands on which mining claims have been filed; mining claims have not been filed on 92 acres (8 percent) of Federal land where the species occurs. Approximately 84 acres (7 percent) of land occupied by this species are privately owned (Forest Service and Bureau 2004). Secondary threats include roads, off-highway vehicle activity, and grazing.

At the time of listing, the Service estimated that fewer than 20 occurrences of Cushenbury milk-vetch were known (59 *Federal Register* 43652). As we noted for Parish's daisy, determining the number of occurrences is a somewhat subjective exercise. Because the species is an annual, distribution and abundance will vary annually depending on rainfall (Olsen 2003).

Recovery Plan

Please refer to the Status of the Parish's Daisy and Its Critical Habitat - Recovery Plan section of this biological opinion for information on the recovery planning and the carbonate habitat management strategy.

Status of Critical Habitat of Cushenbury Milk-vetch

Critical habitat for Cushenbury milk-vetch was designated on December 24, 2002 (67 *Federal Register* 78570). Unless otherwise noted, all of the information in this section is from the final rule.

Cushenbury milk-vetch occurs in the same critical habitat unit as Parish's daisy. Consequently, all of the information for the Northeastern Slope Unit discussed for Parish's daisy is relevant to Cushenbury milk-vetch.

We also used the same processes and criteria to determine critical habitat for Cushenbury milk-vetch as we did for Parish's daisy. Only the primary constituent elements are different. The primary constituent elements for Cushenbury milk-vetch consist of, but are not limited to: soils derived primarily from the upper and middle members of the Bird Spring Formation and Undivided Cambrian parent materials that occur on dry flats and slopes or along rocky washes with limestone outwash/ deposits at elevations between 3,864 and 6,604 feet; soils with intact, natural surfaces that have not been substantially altered by land use activities (e.g., graded, excavated, re-contoured, or otherwise altered by ground-disturbing equipment); and associated plant communities that have areas with an open canopy cover and little accumulation of organic material (e.g., leaf litter) on the surface of the soil.

As we noted in the Status of Critical Habitat of Parish's Daisy section of this biological opinion, we do not know the amount of habitat of the carbonate plant species that existing mining removed. The information discussed at the end of the Status of Critical Habitat of Parish's Daisy section is also relevant for Cushenbury milk-vetch.

ENVIRONMENTAL BASELINE CUSHENBURY MILK-VETCH AND ITS CRITICAL HABITAT**Previous Consultations**

To date, we have formally consulted with the Bureau on one occasion regarding Cushenbury milk-vetch. The Bureau, Forest Service, and Service recently completed formal consultation, pursuant to section 7(a)(2) of the Act, regarding the effects of the carbonate habitat management strategy on the five listed species, including Cushenbury milk-vetch (Olsen 2003). The Service issued a biological opinion regarding the carbonate habitat management strategy to the agencies on May 2, 2005 (Service 2005b). We provide more information on the carbonate habitat management strategy in the Status of the Parish's Daisy and Its Critical Habitat - Recovery Plan

section of this biological opinion contains more information on the carbonate habitat management strategy.

Status of Cushenbury Milk-vetch in the Action Area

The Bureau manages approximately 148 acres of Cushenbury milk-vetch habitat. That amount is approximately 13 percent of the total of 1,201 acres of occupied habitat (Forest Service and Bureau 2004). Most of the occurrences within the action area are at lower elevations than those on Forest Service lands. Maintaining plants in a diversity of habitats, such as may occur over a range of elevations, likely captures a greater degree of genetic variation, which is important in conserving a species on the long term.

The primary land use that has affected critical habitat of Cushenbury milk-vetch is commercial limestone mining, which has occurred on approximately 1,590 acres on the north slope of the San Bernardino Mountains. Only 2 percent of the disturbed area within carbonate habitat (32 of the 1,590 acres) is on lands managed by the Bureau (San Bernardino National Forest GIS database, Eliason pers. comm. 2003a). Most of these impacts occurred prior to Federal listing of the carbonate plants and, to our knowledge, commercial limestone mining does not currently occur within carbonate plant habitat on Bureau lands. Within the last few years, the Bureau issued a patent for 320 acres of land within this region (Threloff pers. comm. 2003). Currently, few land uses occur in areas occupied by Cushenbury milk-vetch.

Status of Critical Habitat of Cushenbury Milk-vetch in the Action Area

Approximately 841 acres (19 percent) of critical habitat of Cushenbury milk-vetch occur on public land managed by the Bureau (Forest Service and Bureau 2004). This acreage indicates the size of the polygons of critical habitat, but not the amount of area that contains the primary constituent elements (67 *Federal Register* 78570). Approximately 543 acres of the critical habitat on public lands have been claimed under the provisions of the mining laws (Forest Service and Bureau 2004). We do not have any further information on the condition of critical habitat in the action area; to the best of our knowledge, most of the area of critical habitat has not been disturbed since its designation.

EFFECTS OF THE ACTION ON CUSHENBURY MILK-VETCH AND ITS CRITICAL HABITAT

Effects of the West Mojave Plan on Cushenbury Milk-vetch and its Critical Habitat

The area where Cushenbury milk-vetch may be affected by the Bureau's proposals includes public lands supporting the species or its critical habitat within the Carbonate Endemic Plants Research Natural Area on the northern slope of the San Bernardino Mountains in the area to the east of Highway 18 and north of the boundary of the San Bernardino National Forest. Figure 2-11 on the final environmental impact report and statement depicts the Carbonate Endemic Plants Research Natural Area. This area is appropriate to consider in this biological opinion because it includes all areas where Cushenbury milk-vetch occurs within the California Desert

Conservation Area; additionally, the Bureau designated the Carbonate Endemic Plants Research Natural Area to include the areas where this species may be found and affected by its activities.

Amendment 1, New Areas of Critical Environmental Concern

The Bureau will designate a 5,169-acre area of critical environmental concern for the carbonate plant species.

Effects on Cushenbury Milk-vetch

The actions proposed by the Bureau and activities that would occur under the provisions of the West Mojave Plan would affect Cushenbury milk-vetch in the same manner as we discussed for Parish's daisy. Consequently, with the exception of the following paragraphs, we will not discuss these effects herein.

The Bureau's proposal to adopt a standard of no surface occupancy to prevent undue and unnecessary degradation of lands, under the surface mining regulations, to protect Cushenbury milk-vetch is another important element of the conservation strategy. As a result of the adoption of this standard, surface disturbance would be prohibited on 80 acres occupied by Cushenbury milk-vetch on public lands that have been claimed under the provisions of the General Mining Law of 1872. Additionally, the same protections would apply to approximately 68 acres of occupied habitat on public lands that have not been claimed under the General Mining Law of 1872. (The areas of claimed and unclaimed land are from Forest Service and Bureau 2004.) Private lands that may be acquired will not be opened to mineral entry. Therefore, these actions will prevent loss of individuals of Cushenbury milk-vetch as a result of mining activities.

The one percent threshold for new ground disturbance will apply in this area of critical environmental concern. Approximately 148 acres of occupied habitat for Cushenbury milk-vetch occur within the area of critical environmental concern. Because of the one percent threshold, up to approximately 52 acres of this occupied habitat may be disturbed. Conversely, Cushenbury milk-vetch occurring on the remaining 96 acres of occupied habitat within this area will not be disturbed by project-level activities. We expect that the likelihood is extremely low that all of the 52 acres of disturbance would occur within occupied habitat of Cushenbury milk-vetch. Consequently, more than 96 acres of habitat occupied by Cushenbury milk-vetch is likely to be conserved. Additionally, this area currently receives little use and few proposals for development; we expect this situation will continue. For these reasons, we conclude that the general management direction provided by the West Mojave Plan will not appreciably reduce the reproduction, numbers, or distribution of Cushenbury milk-vetch.

With the exception of casual use, such as hiking, bird watching, equestrian use, and photography, all of the activities described in this section would be subject to future consultations, pursuant to section 7(a)(2) of the Act, as appropriate. We will be better able to determine the effects of specific actions at the time they are proposed.

Effects on Critical Habitat of Cushenbury Milk-vetch

The actions proposed by the Bureau and activities that would occur under the provisions of the West Mojave Plan would affect critical habitat of Cushenbury milk-vetch in the same manner as we discussed for critical habitat of Parish's daisy. Consequently, with the exception of the following paragraphs, we will not discuss these effects herein.

The Bureau's proposal to adopt a standard of no surface occupancy to prevent undue and unnecessary degradation of lands, under the surface mining regulations, to protect Cushenbury milk-vetch is another important element of the conservation strategy. As a result of the adoption of this standard, surface disturbance would be prohibited on 543 acres of the species' critical habitat on public lands that have been claimed under the provisions of the General Mining Law of 1872. Additionally, the same protections would apply to approximately 298 acres of critical habitat of Cushenbury milk-vetch on public lands that have not been claimed under the General Mining Law of 1872. (The areas of claimed and unclaimed land are from Forest Service and Bureau 2004.) Private lands that may be acquired will not be opened to mineral entry. Therefore, these actions will prevent degradation of the primary constituent elements of critical habitat of Cushenbury milk-vetch as a result of mining activities.

The one percent threshold for new ground disturbance will apply in this area of critical environmental concern. Approximately 799 acres of critical habitat of Cushenbury milk-vetch occur within the area of critical environmental concern (Bureau 2005b). Because of the one percent threshold, up to approximately 52 acres of the critical habitat may be disturbed. Conversely, the remaining 747 acres of critical habitat of Cushenbury milk-vetch within this area will not be disturbed by project-level activities.

Critical habitat outside of the area of critical environmental concern will not be subject to the one percent limit on new disturbance or managed at the same level of protection; consequently, it may be at slightly greater risk of disturbance. The maximum amount of critical habitat of Cushenbury milk-vetch on Bureau lands that may be lost under the provisions of the West Mojave Plan would be 96 acres (i.e., 52 acres within the area of critical environmental concern, plus 44 acres of critical habitat outside of the boundaries of the area of critical environmental concern (Bureau 2005b)). Approximately 841 acres of critical habitat of Cushenbury milk-vetch occur on public lands managed by the Bureau. Under the worst case scenario described in the Carbonate Habitat Management Strategy for Cushenbury milk-vetch, approximately 3,302 acres of the total of 4,356 acres of critical habitat would be set aside; this figure includes the area of critical habitat on both Forest Service and Bureau lands. Consequently, the upper limit of disturbance of critical habitat of Cushenbury milk-vetch that could occur under the direction of the West Mojave Plan would constitute approximately 25 percent of the total area of critical habitat that is likely to be set aside under the auspices of the Carbonate Habitat Management Strategy. We note that this analysis is doubly conservative because we used the upper limits of disturbance on public lands and the lowest estimate of critical habitat set aside on a range wide basis to arrive at this percentage. Consequently, under the worst case scenario, approximately 75 percent of designated critical habitat would not be subject to disturbance. For this reason, we

conclude that the general management direction provided by the West Mojave Plan will not compromise the conservation role and function of critical habitat of Cushenbury milk-vetch.

With the exception of casual use, such as hiking, bird watching, equestrian use, and photography, all of the activities the Bureau would undertake, fund, or authorize in these habitat conservation areas will be subject to future consultations, pursuant to section 7(a)(2) of the Act, as appropriate. We will be better able to determine the effects of specific actions on the primary constituent elements of critical habitat at the time they are proposed.

Amendment 3, Changes in Multiple-use Class Designations

The Bureau proposes to change the multiple-use class designations from Class M to Class L on 4,393 acres on the north slope of the San Bernardino Mountains within the Carbonate Endemic Plants Area of Critical Environmental Concern.

Effects on Cushenbury Milk-vetch

This action will benefit Cushenbury milk-vetch because designation of the area as Class L limits, to a certain degree, the amount of development activity that may occur. We recognize that all development is not prohibited on Class L lands. Our previous biological opinion on the California Desert Conservation Area Plan evaluated the program direction provided by the Bureau's land use classification; we will not repeat that analysis herein. As we noted previously in this biological opinion, specific future actions that the Bureau proposes under the Class L designation will be subject to the consultation requirements of section 7(a)(2) of the Act, as appropriate.

Effects on Critical Habitat of Cushenbury Milk-vetch

The change proposed by the Bureau will promote the conservation role and function of critical habitat by including these portions of critical habitat in areas that will be managed under the guidelines of Class L, because, as we have stated previously in this biological opinion, these guidelines provide a greater emphasis on the conservation of natural resources than other land use classes (with the exception of Class C) and the one percent limit on surface disturbance associated with desert wildlife management areas and area of critical environmental concerns will apply. Specific future actions the Bureau proposes under the Class L designation that may affect critical habitat of Cushenbury milk-vetch will be subject to the consultation requirements of section 7(a)(2) of the Act, as appropriate.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section

because they require separate consultation pursuant to section 7 of the Act. The County of San Bernardino did not identify any projects that are reasonably certain to occur within the action area (Sansone 2005).

CONCLUSIONS

Cushenbury Milk-vetch

After reviewing its current status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to jeopardize the continued existence of Cushenbury milk-vetch.

We reached this conclusion for two reasons. First, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan will ensure that actions the Bureau takes, funds, and authorizes are not likely to reduce appreciably, either directly or indirectly, the reproduction, numbers, or distribution of Cushenbury milk-vetch; additionally, we did not detect any cumulative effects that would substantially alter the status of Cushenbury milk-vetch in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the Parish's daisy and to further its conservation. These measures include, but are not limited to:

- The establishment of an area of critical environmental concern that will be managed in a manner that will promote the survival and recovery of the species within this portion of its range;
- The designation of all lands within the area of critical environmental concern as Class L, which will provide increased protection to Cushenbury milk-vetch over that currently provided by Class M;
- Removal of livestock grazing from habitat occupied by Cushenbury milk-vetch;
- Acquisition of private lands, which will result in a higher level of protection of Cushenbury milk-vetch under the guidance of the California Desert Conservation Area Plan;
- A limit of one percent of new disturbance within the area of critical environmental concern to reduce the loss of Cushenbury milk-vetch, which will ensure that most individuals and their habitat in areas that are essential to their conservation will not be exposed to the adverse effects of human activities; and

- The adoption of a no surface occupancy standard within the area of critical environmental concern, which will eliminate the loss of Cushenbury milk-vetch as a result of mining activities.
- Designation of all routes of travel within the area of critical environmental concern as limited use.

Critical Habitat

After reviewing the current status of critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to destroy or adversely modify the critical habitat of Cushenbury milk-vetch.

We reached this conclusion for two reasons. First, although the condition of critical habitat within some portions of the action area of this consultation has been degraded to a degree because one or more of the primary constituent elements have been disturbed by past human activities, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan are compatible with the function of critical habitat of Cushenbury milk-vetch; additionally, we did not detect any cumulative effects that would alter the status of critical habitat of Cushenbury milk-vetch in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the critical habitat of Cushenbury milk-vetch and to further the proper functioning of the primary constituent elements. These measures include, but are not limited to, the following actions and proposals:

- The establishment of an area of critical environmental concern encompassing most of the critical habitat of Cushenbury milk-vetch and its management in a manner that will promote the survival and recovery of the species within this portion of its range;
- Removal of livestock grazing from critical habitat;
- The designation of all lands within the area of critical environmental concern as Class L, which will facilitate management of critical habitat of Cushenbury milk-vetch to a greater degree than that currently provided by Class M;
- Acquisition of private lands, which will result in a higher level of protection for critical habitat under the guidance of the California Desert Conservation Area Plan;
- A limit of one percent of new disturbance within the area of critical environmental concern, which will ensure that most critical habitat in these areas will not be exposed to the adverse effects of human activities; and

- The adoption of a no surface occupancy standard within the area of critical environmental concern, which will eliminate disturbance to or loss of the primary constituent elements of critical habitat of Cushenbury milk-vetch as a result of mining activities.
- Designation of all routes of travel within the area of critical environmental concern as limited use.

BIOLOGICAL OPINION FOR LANE MOUNTAIN MILK-VETCH

STATUS OF LANE MOUNTAIN MILK-VETCH

Basic Ecology of the Lane Mountain Milk-vetch

The Lane Mountain milk-vetch is a perennial plant species in the pea family. It is a slender, diffuse plant, 12 to 27.5 inches tall, with straggling, freely branched stems that arise from a buried root-crown (Barneby 1964). Herbage is light-gray or greenish, strigulose with short, fine, straight hairs. The flowers, 5 to 15 per stalk, are cream to purple, or lighter with veins of a deeper color. Fruits are pencil-shaped, linear, smooth, and pendant, 0.6 to 1 inch long; each fruit bears 4 to 18 seeds.

Plants of this species typically grow under and entangled within the canopy of low shrubs. Few plants have been observed in the open. Most of the host species are intricately branched low shrubs, but a few of the observed hosts are bunch grasses (*Stipa* sp.) and subshrubs such as Mojave aster (*Machaeranthera tortifolia*) and wishbone bush (*Mirabilis bigelovii*); the most common host plants are turpentine bush (*Thamnosma montana*), white bursage (*Ambrosia dumosa*), California buckwheat (*Eriogonum fasciculatum* var. *polifoium*), Cooper goldenbush (*Ericameria cooperi*), and Mormon tea (*Ephedra nevadensis*) (Charis Professional Services Corporation 2002, Prigge et al. 2000). Host plants are usually living, but Lane Mountain milk-vetch also occurs in dead shrubs. Many of the host species are used more frequently by Lane Mountain milk-vetch than what would be expected by chance based on their abundance in the area (Prigge et al. 2000).

The scrub community at Lane Mountain milk-vetch sites is typically a diverse mix of shrub species. Brandt et al. (1997) characterized milk-vetch sites as areas where Nevada Mormon tea (*Ephedra nevadensis*) and Cooper goldenbush (*Ericameria cooperi*) are dominant shrubs and where the shrub density is greater than in surrounding areas. The Lane Mountain milk-vetch occurs at elevations of approximately 3,100 to 4,100 feet (Charis Professional Services Corporation 2002).

Lane Mountain milk-vetch occurs on rocky, low ridges, only a foot or two higher than the main bajada slope, and rocky low hills, 10 to 20 feet high, where bedrock is exposed or probably near the surface (Lee and Ro Consulting Engineers 1986). It appears to be largely confined to granitic substrates and to a lesser extent on dioritic and gabbroic-derived soils (Charis Professional Services Corporation 2002).

Lane Mountain milk-vetch seems to have a short growing period in very dry years (Bagley 1989). The perennial rootstock may allow the Lane Mountain milk-vetch to survive occasional dry years; it may endure longer periods of drought by remaining dormant. It typically blooms in April and May, but will bloom as early as February if conditions are favorable.

Limited observations on its pollinators were carried out in 2003 (Kearns 2003 in Service 2004b). Although 30 species of insects were observed visiting flowers in the area, only 4 visited Lane Mountain milk-vetch flowers. The most frequent pollinator was *Anthidium dammersi*, a solitary bee in the megachilid family (Megachilidae) that occurs in the Mojave and Colorado deserts of California, Nevada, and Arizona (Kearns 2003 in Service 2004b). Additional pollinator observations were made in 2004 and are continuing in 2005 (Hopkins 2004).

With careful observation, seedlings can be distinguished from resprouts of established plants by the presence of small cotyledons and a reduced number of leaflets on the youngest branches. Sharifi et al. (2004) observed that, at least in one year, most seedlings died before becoming large enough to bear flowers. In a greenhouse, Sharifi et al. (2003) and Sharifi in litt. (2003 in Service 2004b) determined that 11 percent of seeds germinated readily without additional treatment (e.g., scarification or cold stratification) and 100 percent of seeds germinated with scarification. After germination, seedlings reached 1 to 2 inches in length in 4 to 6 weeks, indicating that the seedlings may be allocating most of their initial growth into root production.

Rundel et al. (2004) tracked over 200 Lane Mountain milk-vetch individuals at 5 locations between 1999 and 2004 and found that less than 15 percent had survived over the 5-year time period. This research indicates that successful recruitment (addition of individuals to a population by reproduction) is correlated with, among other factors, annual precipitation of at least 5.9 inches. Annual precipitation between 4.7 and 5.9 inches may allow established individuals to persist, annual precipitation between 2.8 in and 4.7 inches may cause some individuals die due to water stress, and annual precipitation of less than 2.8 inches may cause many individuals die due to water stress or remain dormant. The level of annual precipitation needed for recruitment (more than 5.9 inches) had not occurred between 1998 and 2004 and it appears that the numbers of individuals of Lane Mountain milk-vetch have been in decline since that time. If the length of time between years favorable for recruitment is longer than the average lifespan of individuals, then the species will be dependent on the seedbank to re-establish above-ground populations. Therefore, the numbers of individuals of Lane Mountain milk-vetch fluctuate over time, not only from year to year, but from one decade to the next, depending on long-term climatic trends. This aspect of the ecology of the species is important to understand in the context of management decisions regarding the maintenance of habitat of suitable quality to maximize the reproductive potential of the species during climatically favorable years.

Status of Lane Mountain Milk-vetch

Lane Mountain milk-vetch was listed as endangered on October 6, 1998 (63 *Federal Register* 53596). The Lane Mountain milk-vetch was listed because of threats related to habitat destruction from dry wash gold mining, other mining activities (materials lease mining), rock

and mineral collecting, off-highway vehicle activity, and potentially from increasing fire frequency and any associated fire suppression activities.

The Lane Mountain milk-vetch is known only from four occurrences within an area of land that is approximately 18 miles in diameter. The southwestern end of the range lies on the northeastern slopes of the Mud Hills; from the Mud Hills, occurrences extend generally to the northeast, across the lower slopes of Lane Mountain and the northern portion of the Paradise Range, ending in unnamed hills in the southern portion of the Goldstone Deep Space Communications Complex. The NASA Goldstone occurrence is located on lands managed by the National Aeronautics and Space Administration and the Department of the Army within the boundaries of Fort Irwin; it is located to the east of the Superior Valley parcel. The Brinkman Wash-Montana Mine occurrence is located within the boundaries of Fort Irwin to the southwest of the NASA Goldstone occurrence. Most of the Paradise Valley occurrence is located within the boundaries of Fort Irwin to the west and southwest of the Brinkman Wash-Montana Mine occurrence; the remaining portions of the occurrence are located on lands managed by the Bureau. We will discuss the Coolgardie Mesa occurrence, which is located to the southwest of the Paradise Valley occurrence, in the Environmental Baseline section of this biological opinion. Based on the available historical and recent information, the Lane Mountain milk-vetch does not appear to have been more widespread than is currently known; no extirpations of populations have been documented.

From mid-April through early August, 2001, the Army conducted extensive surveys for the Lane Mountain milk-vetch. A full description of the methodologies is provided in Charis Professional Services Corporation (2002). The surveys were focused on areas that had not been surveyed in 1999 because data from the 1999 survey was to be included in the final results. The primary objectives of the survey were to identify new occurrences of the Lane Mountain milk-vetch, determine the boundaries of the occurrences, and collect enough information to estimate population numbers. The surveyors used three types of transects; each transect type involved 4 to 7 surveyors walking approximately 30 feet apart and making one or more passes over an area. The surveyors collected GPS and other data on each plant that was detected; after the first 2 weeks, the surveyors reduced the amount of data that were being collected on each plant because of the large number of individuals being detected.

The boundaries of occurrences were mapped to include every plant that was found. The extent of each occurrence was then mapped using a minimum convex polygon (i.e., the smallest polygon in which no internal angle exceeds 180 degrees). The average density of plants was calculated by dividing the total number of plants observed in the occurrence for the area within the transects. The number of plants in the occurrence was then calculated by multiplying the size of the occurrence by the average density of plants. Because individuals of the Lane Mountain milk-vetch are difficult to observe for a variety of reasons and different surveyors vary in their ability to detect plants, the Army developed an “observability” formula to assist in estimating the total number of plants in each occurrence. The following table provides an estimate of the number of Lane Mountain milk-vetch plants adjusted by the observability factor and the actual number of plants observed during surveys within the occurrences found on land managed by the Department of the Army.

Percentage of Observability	NASA Goldstone	Brinkman Wash-Montana Mine	Paradise Valley ³	All Locations Combined ²
10 percent	1,399	3,109	4,324	14,121
50 percent	2,799	6,219	8,648	28,241
100 percent	13,993	31,094	43,239	141,207
Total Recorded Plants ^{1,2}	555	1,487	1,667	5,723

¹ The total number of plants includes only those detected in the 1999 and 2001 surveys. The total number of plants includes mature plants only; seedlings are excluded from the total.

² The total number of plants is for the entire range; that is, it includes plants found on Bureau and private lands on Coolgardie Mesa even though this occurrence is not included in this table. Information on the number of plants within the Coolgardie Mesa occurrence is contained in the Environmental Baseline section for Lane Mountain milk-vetch.

³ The total number of plants for the Paradise Valley occurrence includes plants found on Bureau and private lands outside the boundaries of Fort Irwin. Because the area of this occurrence on Bureau and private lands is a small fraction of the area of entire occurrence, the number of plants is also likely to be a small portion of the total.

The Army conducted additional surveys in 2003. Nine new plants were found clustered in a relatively small area outside the boundary of the Paradise Valley occurrence (Science Applications International Corporation 2003). Mike Dungan of Science Applications International Corporation, who conducted the 2003 surveys, did not believe that these plants warranted increasing the minimum convex polygon for the occurrence. Three new plants were also found outside the boundary of the Coolgardie Mesa occurrence in 2003; Dr. Dungan believed that these individuals did not justify expanding the map of the distribution of Lane Mountain milk-vetch at Coolgardie Mesa.

The Army speculates that the sizes of the occurrences and numbers of individuals likely represent minimum levels “because the survey year represented a normal rainfall year preceded by (2) years of drought and population boundaries were conservatively drawn” and that the boundaries of the occurrences and numbers of individuals may fluctuate after several successive years of normal or above normal rainfall (Charis Professional Services Corporation 2003). We cannot address the degree of conservatism used to draw the boundaries of the occurrences; however, we expect that the information presented in the biological assessment likely represents a reasonable distribution of the plants. Given the normal patterns of rainfall in the Mojave Desert, we would not expect that short-term differences in rainfall would substantially alter the distribution of the Lane Mountain milk-vetch.

The following table describes the current acreage of the occurrences, based on the Army’s use of minimum convex polygons to define the boundaries, and ownership information.

	NASA Goldstone	Brinkman Wash- Montana Mine	Paradise Valley	All Locations Combined ⁴
Acreage ¹	1,283	5,497	4,794	21,349
Land Management Agencies or Owners	Army, NASA	Army ²	Army, Bureau ³	

¹Total acreage in polygons.

²This occurrence includes a small amount of private and State Lands Commission lands; however, the Army proposes to acquire these areas.

³This occurrence includes a small amount of private lands; these areas are proposed for acquisition by the Army or, if they occur outside the boundaries of Fort Irwin, by either the Army or Bureau.

⁴The total acreage is for the entire range; that is, it includes areas on Bureau and private lands on Coolgardie Mesa even though this occurrence is not included in this table. Information on the acreage for the Coolgardie Mesa occurrence is contained in the Environmental Baseline section for the Lane Mountain milk-vetch.

Note that the Service issued a biological opinion to the Army on March 15, 2004, regarding the proposed use of additional training lands at Fort Irwin. In the biological opinion, we concluded that the proposed action was not likely to jeopardize the continued existence of the Lane Mountain milk-vetch. The Army estimated that approximately 11,387 acres of Lane Mountain milk-vetch habitat occur within Fort Irwin. As a result of the proposed action, approximately 6,789 acres would be placed in conservation areas and a 'no-dig' zone; this amount comprises approximately 58.6 percent of the area within the occurrences. The use of the new training lands would result in the loss of approximately 4,598 acres; this amount comprises approximately 21.5 percent of the known habitat for this species.

Recovery Plan

The Service is currently preparing a recovery plan.

Status of Critical Habitat of Lane Mountain Milk-vetch

We published a proposal to designate critical habitat for the Lane Mountain milk-vetch on April 6, 2004 (69 *Federal Register* 18018). In our final rule, which was published on April 8, 2005, we did not designate any critical habitat, based on the "evaluation of the relationship of essential habitat to sections 3(5)(a), 4(a)(3), and 4(b)(2) of the Act" (70 *Federal Register* 18220).

Consequently, we will not discuss critical habitat in relation to the Lane Mountain milk-vetch again in this biological opinion.

ENVIRONMENTAL BASELINE FOR LANE MOUNTAIN MILK-VETCH

Previous Consultations

Sheep grazing has not occurred within the habitat of this species since 1989 as a result, first, of drought and, secondly, of a consultation between the Service and Bureau on the desert tortoise. That consultation resulted in a grazing program for the western Mojave Desert in which sheep were excluded from most of the area designated as critical habitat for the desert tortoise (Service 1994d). The Lane Mountain milk-vetch occurrences in the action area of this consultation are entirely within critical habitat of the desert tortoise.

On February 27, 2002, the Service issued a biological opinion in which we found that the continued implementation of the California Desert Conservation Area Plan, as amended and modified by interim measures, was not likely to jeopardize the continued existence of the Lane Mountain milk-vetch (Service 2002c). This program level biological opinion evaluated the management direction contained in the California Desert Conservation Area Plan. It did not address any specific future actions, although it acknowledged that casual uses authorized by the California Desert Conservation Area Plan could possibly affect the Lane Mountain milk-vetch and its habitat to a limited degree.

On June 30, 2003, the Service issued a biological opinion for route designation in the western Mojave Desert; we determined that the proposed action was not likely to jeopardize the continued existence of the Lane Mountain milk-vetch (Service 2003a). This biological opinion evaluated the specific route network in existence in the western Mojave Desert. It did not address any specific future actions, although it acknowledged that casual use of designated routes could possibly affect the Lane Mountain milk-vetch and its habitat to a limited degree.

Status of the Lane Mountain Milk-vetch in the Action Area

The Coolgardie Mesa occurrence and a small portion of the Paradise Valley occurrence are located at least partially on public lands. The portion of the Paradise Valley occurrence outside of Fort Irwin is approximately 200 acres. The Coolgardie Mesa occurrence covers approximately 9,775 acres; approximately 718 acres (7.3 percent) of this occurrence are privately owned (Service 2005e). The Department of the Army has acquired several parcels of land in this area as mitigation for the impacts of using additional training lands within Fort Irwin.

The action area supports approximately 9,975 acres of occupied habitat of Lane Mountain milk-vetch and therefore includes almost half of the total area occupied by the species. Given the area of occupied Lane Mountain milk-vetch habitat that will likely be disturbed by future training activities within Fort Irwin, conservation of the occurrences on public lands is essential.

The survey conducted by the Army in 2001 constitutes the best available data on the abundance of the Lane Mountain milk-vetch in the action area. Using the same analysis that was described in the Status of the Lane Mountain Milk-vetch section of this biological opinion, the Army concluded that, at 100, 50, and 10 percent of observability, the occurrence of the Lane Mountain milk-vetch on Coolgardie Mesa supports 5,288, 10,576, and 52,881 plants respectively; 2,014 plants were recorded during the survey.

The final environmental impact report and statement notes that the Coolgardie mining district overlaps the western portion of the proposed Coolgardie Conservation Area. This part of the California Desert Conservation Area is managed for mining activity under multiple-use Class L. Gasoline or hand-powered dry washing or sluicing has been done intermittently in this area since 1900. The heaviest concentration of mining claims lies to the west. Schulte (2005a, b) reports that the 22 mining claims located within the Coolgardie Conservation Area cover approximately 785 acres. Approximately 10,107 acres of public lands lie within this 13,354-acre conservation area (Bureau et al. 2005).

The West Paradise Conservation Area includes 1,243 acres; the Bureau manages approximately 257 acres within this area (Bureau et al. 2005). This area supports a moderate potential for mineral resources (Schulte 2005b); it does not contain any claimed areas (Bureau 2003f).

Members of at least four recreational prospecting and mining clubs frequent the area. The larger clubs may have a membership of 400 families. Most of these individuals are operating under casual use and may continue to do so as long as they reclaim their hand-dug pits and the cumulative disturbance does not cause more than “negligible” disturbance (Bureau et al. 2005).

The Coolgardie Mesa occurrence is crossed by numerous roads. In many areas, vehicles seem to remain primarily on the established routes. In the southernmost portion of the occurrence, off-road vehicles use a few large denuded areas as staging areas and spread out from this area. Mark Hessing (pers. comm. 2004) notes that he has observed off-road vehicles traveling through habitat of the Lane Mountain milk-vetch approximately 0.25 mile to the west of Copper City Road, the main dirt road through this occurrence.

As part of the proposed action for the use of additional training lands at Fort Irwin, the Army committed to providing funds or labor to close and rehabilitate roads in the Coolgardie Mesa and West Paradise Conservation Areas. Closure and rehabilitation of unauthorized routes would be an important element in the conservation of the Lane Mountain milk-vetch. Designation and clear marking of open routes in this area, combined with acquisition of private parcels, would allow law enforcement personnel from the Bureau to protect Lane Mountain milk-vetch habitat more effectively. The physical closure of roads, which the Army has proposed to fund, would also increase the level of protection for the Lane Mountain milk-vetch by reducing access points to its habitat and better enabling the Bureau’s rangers to police the route network. In total, the measures proposed by the Army should improve the baseline conditions of the Lane Mountain milk-vetch within the action area.

EFFECTS OF THE WEST MOJAVE PLAN ON LANE MOUNTAIN MILK-VETCH

The area where Lane Mountain milk-vetch may be affected by the Bureau's proposals includes all public lands within the West Paradise and Coolgardie Mesa conservation areas in the region generally located to the north of the city of Barstow and south of Fort Irwin. These conservation areas cover 257 and 10,107 acres, respectively. Figure 2-10 on the final environmental impact report and statement depicts these areas. This area is appropriate to consider in this biological opinion because it includes all areas where Lane Mountain milk-vetch occurs within the California Desert Conservation Area; additionally, the Bureau designated the West Paradise and Coolgardie Mesa conservation areas to include the areas where this species may be found and affected by its activities.

Amendment 1, New Areas of Critical Environmental Concern

The Bureau will designate two areas of critical environmental concern for Lane Mountain milk-vetch. The Coolgardie Mesa Conservation Area will cover 10,107 acres of public land. The West Paradise Conservation Area will cover 257 acres of public land.

The actions proposed by the Bureau and activities that would occur under the provisions of the West Mojave Plan would affect Lane Mountain milk-vetch in the same manner as we discussed for Parish's daisy. Consequently, with the exception of the following paragraphs, we will not discuss these effects herein.

The Bureau's proposal to withdraw the habitat conservation area from mineral entry, subject to valid existing rights, to protect Lane Mountain milk-vetch is an important element of the conservation strategy. As a result of the withdrawal, approximately 9,322 acres of public lands within the Coolgardie Conservation Area that have not been claimed under the General Mining Law of 1872 would be unavailable for any type of exploration or development of minerals. (The acreage of claimed land cited in this discussion is from Schulte 2005b. We arrived at the estimate of 9,322 acres of unclaimed public lands by subtracting the acreage of claimed public lands provided by Schulte [2005b] for the acreage of public lands in the conservation area cited in the environmental impact report and statement. See Table 2-31.) An additional 785 acres of the habitat conservation area (Schulte 2005b) that have already been claimed could be subjected to validity examinations to determine if a claimed area contains economically viable mineral deposits; if the claim does not contain economically viable mineral deposits, the Bureau could deny an application to mine the area and extinguish the claim. The 257 acres of public land within the West Paradise Conservation Area will also be withdrawn from mineral entry. Private lands that may be acquired will not be opened to mineral entry. These actions will likely prevent degradation of the conservation areas by mining clubs and others interested in mineral resources.

The one percent threshold for new ground disturbance will apply in these areas of critical environmental concern. Because of the one percent threshold, up to approximately 2.6 acres of the West Paradise Conservation Area and 101 acres of the Coolgardie Mesa Conservation Area may be disturbed. Conversely, Lane Mountain milk-vetch occurring on the remaining 254 and 10,006 acres of the two conservation areas, respectively, will not be disturbed by project-level

activities. Note also that measure P-26 on page 2-108 of the final environmental impact report and statement states that the Bureau will not issue any permits that involve loss of Lane Mountain milk-vetch plants; this measure should ensure that activities authorized by the Bureau do not result in a direct reduction in the number of individuals of this species. For these reasons, we conclude that the general management direction provided by the West Mojave Plan will not appreciably reduce the reproduction, numbers, or distribution of Lane Mountain milk-vetch.

With the exception of casual use, such as hiking, bird watching, equestrian use, and photography, all of the activities that the Bureau would undertake, fund, or authorize in these conservation areas will be subject to future consultations, pursuant to section 7(a)(2) of the Act, as appropriate. We will be better able to determine the effects of specific actions at the time they are proposed. Given the commitments made by the Bureau through measure P-26 in the final environmental impact report and statement, we anticipate that future actions are unlikely to cause appreciable deterioration of the status of Lane Mountain milk-vetch.

Amendment 3, Changes in Multiple-use Class Designations

The Bureau would change the multiple-use class designations from Class M to L on 10,364 acres within the Coolgardie Mesa and West Paradise conservation areas to benefit Lane Mountain milk-vetch.

This action will benefit Lane Mountain milk-vetch because designation of these areas as Class L limits, to a certain degree, the amount of development activity that may occur. We recognize that all development is not prohibited on Class L lands. Our previous biological opinion on the California Desert Conservation Area Plan evaluated the program direction provided by the Bureau's land use classification; we will not repeat that analysis herein. As we noted previously in this biological opinion, specific future actions that the Bureau proposes under the Class L designation will be subject to the consultation requirements of section 7(a)(2) of the Act, as appropriate.

Amendment 9, Public Land Vehicle Access Network

The Bureau proposes to eliminate an additional 5 miles of routes within the area occupied by Lane Mountain milk-vetch than were proposed in the initial route designation process; approximately 21 miles of routes would remain in habitat of the Lane Mountain milk-vetch in the Coolgardie Mesa area after adoption of the amended California Desert Conservation Area Plan (Pratini pers. comm. 2004). The legal use of designated routes could negatively affect the Lane Mountain milk-vetch if dust generated by the passage of vehicles impairs the rate of photosynthesis or the effectiveness of pollinators. The U.S. Geological Survey evaluated the effects of dust on Lane Mountain milk-vetch and concluded that, at the current level of use, dust generated by vehicle use of unpaved roads on Coolgardie Mesa does not greatly affect Lane Mountain milk-vetch (Wijayratne et al. 2005). To date, the effects of dust on pollinators of Lane Mountain milk-vetch have not been studied; we anticipate that, at the current level of use, these effects will be minor because Lane Mountain milk-vetch plants reproduce in close proximity to the routes of travel.

The presence of designated routes of travel through or near the habitat of Lane Mountain milk-vetch facilitates illegal vehicle use off of designated routes. Although the section 7(a)(2) process is not intended to review illegal activities, unauthorized off-road use occurs at least partially as a result of authorized activities and access. The terrain where the Lane Mountain milk-vetch occurs is accessible and can be traversed by both motorcycles and four-wheeled vehicles. In the past, we have observed tracks made by motorcycles within and adjacent to habitat of the Lane Mountain milk-vetch, both on Coolgardie Mesa and on former public lands west of the Paradise Range. More recently, we have observed high levels of vehicular use off of designated routes in the southwestern portion of Lane Mountain milk-vetch habitat on Coolgardie Mesa. The Environmental Baseline section of this section of the biological opinion provides more information on this unauthorized activity.

The reduction in the amount of routes proposed by the Bureau may, in and of itself, diminish the effects of unauthorized use of vehicles in Lane Mountain milk-vetch habitat, primarily because the unauthorized users seem to establish base camps near designated routes; most damage to habitat occurs relatively near these staging areas. The reduction in designated routes would likely render at least some portions of Lane Mountain milk-vetch habitat more distant from staging areas and therefore less likely to be damaged by off-road use. Note that the administrative designation of a route as closed may be ineffective until the Bureau can eliminate the road on the ground; funding that the Army has committed to provide to mitigate for the effects of the expansion of Fort Irwin should enable the Bureau to implement numerous route closure projects.

Amendment 10, Stopping and Parking of Motorized Vehicles and Vehicular Camping

Under the proposed amendment to the California Desert Conservation Area Plan, the distance from the centerline of a route that motorized vehicles will be allowed to stop, park, and camp will be reduced from 300 to 50 feet. Such off-road travel can crush individuals of the Lane Mountain milk-vetch and its host plants, degrade habitat (particularly by removing the thin granitic substrates where Lane Mountain milk-vetch plants grow), and cause the spread of non-native plant species. Neither we nor the Bureau can provide any quantitative information on how frequently desert users leave routes of travel for these distances to camp, stop, and park outside of existing disturbed areas. In at least some areas that are occupied by the Lane Mountain milk-vetch, the density of vegetation would likely prevent most desert users from leaving designated routes of travel. We acknowledge that the proposed action would decrease the distance that vehicles are allowed to travel away from roads; as such, the proposed action will reduce the potential that off-road vehicle use will damage Lane Mountain milk-vetch and its habitat when compared with the current situation. We also acknowledge that, in our experience with areas that are occupied by this species, we have not seen any evidence that people are using areas away from designated routes for stopping, parking, and camping. The staging areas for unauthorized off-road vehicle use at the southern end of the Coolgardie Mesa occurrence may be considered an exception to this statement. These staging areas are heavily disturbed and devoid of most vegetation; the Bureau does not anticipate that the stopping, parking, and camping proposed by this amendment would cause this amount of degradation.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The County of San Bernardino did not identify any actions that are reasonably certain to occur within the action area for Lane Mountain milk-vetch (Sansone 2004).

CONCLUSION

After reviewing its current status, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the amendment of the California Desert Conservation Area Plan, as proposed by the Bureau through the West Mojave Plan, is not likely to jeopardize the continued existence of Lane Mountain milk-vetch.

We reached this conclusion for two reasons. First, the general guidance provided by the California Desert Conservation Area Plan and the specific actions contained in the West Mojave Plan will ensure that actions the Bureau takes, funds, and authorizes are not likely to reduce appreciably, either directly or indirectly, the reproduction, numbers, or distribution of Lane Mountain milk-vetch; additionally, we did not detect any cumulative effects that would substantially alter the status of Lane Mountain milk-vetch in the action area. Second, the Bureau has proposed and, in some cases, already implemented, measures to avoid or reduce adverse effects to the Lane Mountain milk-vetch and to further its conservation. These measures include, but are not limited to:

- The establishment of areas of critical environmental concern that will be managed in a manner that will promote the survival and recovery of the species within this portion of its range;
- The designation of all lands within the area of critical environmental concern as Class L, which will provide increased protection to Lane Mountain milk-vetch over that currently provided by Class M;
- Removal of livestock grazing from habitat occupied by Lane Mountain milk-vetch;
- Acquisition of private lands, which will result in a higher level of protection of Lane Mountain milk-vetch under the guidance of the California Desert Conservation Area Plan;
- A limit of one percent of new disturbance within the area of critical environmental concern to reduce the loss of Lane Mountain milk-vetch, which will ensure that most individuals and their habitat in areas that are essential to their conservation will not be exposed to the adverse effects of human activities; and

- The withdrawal of the area of critical environmental concern from mineral location and entry, which has the potential to reduce, to some degree the number of individuals of Lane Mountain milk-vetch that may be destroyed or disturbed during casual use and under future plans of operation.
- The provision that no activities will be authorized that involve loss of individual Lane Mountain milk-vetch plants.

INCIDENTAL TAKE STATEMENT

Desert Tortoise

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement and occurs as a result of the action as proposed by the Bureau.

The measures described below are non-discretionary and must be undertaken by the Bureau or made binding conditions of any authorization provided to permittees. The Bureau has a continuing duty to regulate the activities covered by this incidental take statement. If the Bureau fails to assume and implement the terms and conditions of the incidental take statement or to make them enforceable terms of permit or grant documents, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Bureau must report the progress of its action and their impact on the species to the Service as specified in the incidental take statement (50 *Code of Federal Regulations* 402.14(i)(3)).

The California Desert Conservation Area Plan and West Mojave Plan describe numerous programs under which the Bureau will need to make specific decisions with regard to future actions. Although we have evaluated the general nature of the effects of these actions, both negative and positive, on listed species, we cannot fully assess the potential effects of specific future actions under these programs because information on the location, timing, nature, and other aspects of the actions is not available at this time. Consequently, we cannot provide an exemption from the prohibitions against take, as described in section 9 of the Act, for the incidental take that may result from these future actions that require separate review and authorization by the Bureau. We will review the effects of those actions and, through the section

7(a)(2) consultation process, issue incidental take statements in the future, if appropriate, when the Bureau requests formal consultation on specific discretionary actions.

Given this limitation, this biological opinion provides an exemption from the prohibitions against take only for the incidental take of desert tortoises that is likely to result from actions that are inherently authorized by the approval of the California Desert Conservation Area Plan or its amendments, such as the West Mojave Plan, or from actions for which the record of decision for this bioregional plan constitutes the Bureau's final authorization. These activities include casual use and ongoing grazing within the planning area for the western Mojave Desert.

We cannot quantify the precise numbers of desert tortoises that may be killed or injured as a result of the actions that the Bureau authorizes through approval of the California Desert Conservation Area Plan, as amended by the West Mojave Plan, because of the large size of the action area, the patchy distribution of desert tortoises within the western Mojave Desert, and the unpredictability of when these activities are likely to cause injury or mortality to desert tortoises. Additionally, finding carcasses and assigning a cause of death is problematic over such large areas and in the presence of numerous scavengers that are likely to find dead desert tortoises soon after they die. However, we anticipate that the activities authorized by the Bureau as a direct result of the signing of the record of decision for the West Mojave Plan will result in the incidental take of relatively few desert tortoises.

Casual Use

Incidental take of desert tortoises is likely to occur through casual use (such as walking, equestrian use, or mining conducted at this level, wherever such activities are authorized within the approximately 3,263,874 acres of land managed by the Bureau within the planning area.

Incidental take of desert tortoises is also likely to occur through casual use, in the form of operating vehicles, within the boundaries established for the West Mojave Plan, in the following areas in an authorized manner:

1. along approximately 5,433.4 miles of routes designated as open or limited (see LaPre 2005e for mileage of open routes within habitat of the desert tortoise);
2. along 30.6 miles of routes designated as limited (see LaPre 2005h for mileage of limited routes within habitat of the desert tortoise);
3. within desert wildlife management areas, when camping in previously disturbed areas adjacent to motorized vehicle routes designated as open;
4. within desert wildlife management areas, within 50 feet of the centerline of open routes when stopping and parking; and
5. outside of desert wildlife management areas, within 300 feet of the centerline of open routes when stopping, parking, and camping.

We also consider this exemption to apply to causal use activities that may occur on any lands that the Bureau may acquire, provided that the activities causing the take are in compliance with the Bureau's management direction provided by the California Desert Conservation Area Plan, as amended, and analyzed herein. Note that this exemption may not apply to any desert tortoises that may reside on public lands that are transferred from the management of the Bureau. In such instances, the Service would have to determine whether the exemption would remain in place on a case-by-case basis; the factors we would consider in such cases would include, but not be limited to, any changes in the nature and intensity of use that would result from the transfer.

Livestock Grazing

Incidental take of desert tortoises is likely to occur during activities associated with livestock grazing (but not including new range developments or harm, as defined in the first paragraph of this section) on public lands and intermingled non-federal lands within the boundaries of the following allotments. This incidental take statement exempts incidental take resulting from livestock grazing only on the lands specified in the following table.

Allotment	Acreage of Desert Tortoise Habitat Where Incidental Take Exemption Applies¹
Bissell	2,360 ⁴
Boron	10,868 ⁴
Cantil Common (North)	203,567 ²
Cantil Common (South)	13,000 ^{2,4}
Hansen Common	3,709
Johnson Valley	118,297
Lava Mountain	20,902
Monolith-Cantil	12,938 ²
Ord Mountain	154,547
Rattlesnake Canyon	12,805
Rudnick Common	79,000
Shadow Mountain	16,936 ^{2,4}
Spangler Hills	69,141
Stoddard Mountain (East)	86,099 ²
Stoddard Mountain (Middle)	5,787 ^{2,4}
Tunawee Common	1,800
Walker Pass Common	32,058
Total	843,814

¹ Unless otherwise stated, acreages are from the sources cited in the Effects of the Proposed Grazing Program on the Desert Tortoise and its Critical Habitat section of this biological opinion. As we noted previously in this biological opinion, some acreage figures for the same area may vary because of differences of data in GIS coverage.

² See attached map. Acreages are from Service (2006).

³ Total does not include lands managed by the California Department of Fish and Game.

⁴ Incidental take exemption applies only to public lands.

Relationship to Incidental Take Statements in Previous Biological Opinions

Through memoranda dated May 17, 1999, and August 3, 2000, the Service (1999b, 2000) extended the incidental take statements that were contained in previous biological opinions for sheep and cattle grazing in the California Desert Conservation Area until such time as the bioregional plans were completed. With the issuance of this biological opinion, this incidental take statement replaces those contained in previous biological opinions regarding livestock grazing for the western Mojave Desert.

This incidental take statement also replaces the incidental take statements contained in the biological opinions for route designation in the western Mojave Desert (Service 2003b) planning area and for management of the planning area described in the Rand Mountains – Fremont Valley Management Plan (Service 1993a). This biological opinion also supercedes the previous biological opinions for the Western Mojave Land Tenure Adjustment Project (Service 1990 and 1998; we re-iterate that, as stated in the later biological opinion, the incidental take statement contained in the 1990 biological opinion is no longer valid.

Effects of the Incidental Take on the Desert Tortoise

All of the activities for which we exempted incidental take have some potential for killing or injuring desert tortoises. Activities such as casual use involving walking, equestrian use, and mining will likely kill or injure very few desert tortoises because these activities are generally low in intensity and scattered over large areas; additionally, because these activities generally involve low speeds, desert tortoises can be seen and avoided.

Stopping and parking within 50 feet of open or limited routes will likely kill few desert tortoises because of the limited area in which this activity will occur, relative to the size of the desert wildlife management areas and considering that terrain and vegetation prohibit this activity in many areas. Camping in disturbed areas will likely kill very few desert tortoises because they are less likely to be in these areas and would be more easily observed in areas that have reduced levels of vegetation.

We anticipate that cattle grazing will directly kill or injure few desert tortoises because livestock attempt to avoid stepping on larger animals; also, this use is dispersed to a large degree, in relation to the distribution of desert tortoises. We acknowledge smaller desert tortoises are at greater risk. Although sheep have the potential to kill more desert tortoises, relatively, than cattle, few desert tortoises are likely to be killed because the vast majority of sheep grazing will occur in areas where they persist in lower numbers. The exemption with regard to livestock grazing does not extend to specific range improvements because the Bureau will need to authorize those on a case-by-case basis or to mortality that may be caused by degradation of habitat; in the latter case, we expect that the Bureau's monitoring and management of livestock use will preclude significant habitat modification or degradation that could result in death or

injury to desert tortoises by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. The Bureau's grazing prescriptions and standards and guidelines are specifically designed to maintain or improve the condition of habitat; therefore, any degradation of habitat that would likely lead to mortality in desert tortoises would be outside the bounds of the proposed action.

Other forms of activities, such as casual use involving vehicles on routes designated as open or limited, and stopping, parking, and camping within 300 feet of such routes, pose the greatest risk to desert tortoises and are likely to kill or injure more animals because these activities can be conducted at greater speeds and involve large areas of the desert. In spite of these facts, we anticipate that relatively few desert tortoises will be killed or injured for several reasons. Many users of the desert will attempt to avoid killing animals with their vehicles. A large portion of the use will occur when desert tortoises are less active; we acknowledge that the periods of heaviest use – the spring and fall – are also when desert tortoises are most likely to be moving longer distances, which puts them at greater risk.

Many of the actions for which we have exempted incidental take are likely to occur in disturbed areas (e.g., camping off roads) or will not, by their nature, cause removal of habitat (e.g., hiking) to the extent that it would result in harm to desert tortoises. We anticipate that grazing and casual use are likely to result in relatively few mortalities of or injuries to desert tortoises.

In conclusion, despite the numerous actions that will occur and have the potential to kill or injure desert tortoises, we anticipate that relatively few desert tortoises will be killed or injured by these activities.

Parish's Daisy, Cushenbury Milk-vetch, and Lane Mountain Milk-vetch

Section 9 of the Act does not address the incidental take of listed plant species. Because the Act does not address the take of listed plant species, this biological opinion does not contain an incidental take statement, reasonable and prudent measures, or terms and conditions for these species.

The Bureau should be aware that the Act prohibits the removal of endangered plants from Federal lands and their reduction to possession, the malicious damaging, or destruction on such lands; by regulation, the Service extended this prohibition to threatened species. Section 9(a)(2)(B) prohibits any person from removing, cutting, digging up, or damaging or destroying individuals of an endangered listed plant species in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

REASONABLE AND PRUDENT MEASURE

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize take of the desert tortoise during activities that may result in incidental take that are

directly authorized by adoption of the amendment to the California Desert Conservation Area Plan for the Western Mojave Recovery Unit:

The Bureau must ensure that the level of incidental take anticipated in this biological opinion is commensurate with the analysis contained herein.

The Service's evaluation of the effects of the proposed action includes consideration of the measures developed by the Bureau and repeated in the Description of the Proposed Action portion of this biological opinion to reduce the adverse effects of grazing and casual use on the desert tortoise. Any subsequent changes in the minimization measures proposed by the Bureau or in the conditions under which cattle grazing currently occurs may constitute a modification of the proposed action and may warrant re-initiation of formal consultation, as specified at 50 *Code of Federal Regulations* 402.16. This reasonable and prudent measure is intended to supplement the protective measures that were proposed by the Bureau as part of the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following term and condition, which implements the reasonable and prudent measure described in the previous section; the Bureau must also comply with the reporting requirements described in the following two sections. This term and condition is non-discretionary.

The following term and condition implements the reasonable and prudent measure:

- a. To ensure that the measures proposed by the Bureau are effective and are being properly implemented, the Bureau must contact the Service immediately if it becomes aware that a desert tortoise has been killed or injured by human activities associated with casual use. At that time, the Service and the Bureau must review the circumstances surrounding the incident to determine whether additional protective measures are required. Grazing and casual use may continue pending the outcome of the review, provided that the protective measures contained in the Bureau's proposed action have been and continue to be fully implemented. If, after completion of the review, the Service and Bureau agree that additional protective measures are required, the Bureau must implement the additional measures.
- b. If more than three desert tortoises are found dead or injured in any 12-month period as a result of any specific activity or circumstance, the Bureau must contact the Service to determine whether formal consultation should be re-initiated on that aspect of the West Mojave Plan. This threshold is intended to determine whether certain activities or circumstances (e.g., desert tortoises being trapped in cattle guards or killed along one portion of a road) may be affecting desert tortoises more substantially than we anticipated. The threshold would not be used in situations that we would reasonably expect to occur and that have been considered by the Bureau and Service during this consultation (e.g., desert tortoises being consumed by common ravens.)

REPORTING REQUIREMENTS

By January 31 of each year this biological opinion is in effect, the Bureau must provide a report to the Service that provides details on each desert tortoise that is found dead or injured. The report must include information on the location of each mortality, the circumstances of the incident, and any actions undertaken to prevent similar instances from occurring in the future.

We request that the annual report also describe activities that the Bureau implemented (e.g., the amount of road maintained, habitat restored, etc.) to recover the desert tortoise in the previous year. We also request that your annual report include information on any activities that the Bureau undertakes that may have adversely affected or benefited the listed plant species under consideration in this biological opinion.

DISPOSITION OF DEAD OR INJURED DESERT TORTOISES

Within 3 days of locating a desert tortoise that may have been killed or injured as a result of causal use, you must notify the Service's Division of Law Enforcement (370 Amapola Avenue, Suite 114, Torrance, California 90501) and the Ventura Fish and Wildlife Office by telephone (805 644-1766) and by facsimile (805 644-3958). The report must include the date, time, and location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Injured desert tortoises must be taken to a qualified veterinarian for treatment. If any injured desert tortoises survive, the Service must be contacted regarding their final disposition.

Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. The remains of desert tortoises must be placed with the U.S. Geological Survey (Contact: Kristin Berry, U.S. Geological Survey, 22835 Calle San Juan De Los Lagos, Moreno Valley, California 92553, (951-697-5361); if the U.S. Geological Survey does not want the carcass because the damage is too extensive, the carcass must be disposed of in an appropriate manner. We recommend that the Bureau maintain a standing arrangement with the U.S. Geological Survey regarding proper disposition of carcasses and ensure that its field offices are well aware this and other procedures regarding the disposition of dead or injured desert tortoises.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We offer the following conservation recommendations for your consideration:

Casual Use. The Bureau should provide information on the desert tortoise, its status, the protection it receives under the Endangered Species Act, and the actions that can be taken to avoid killing or injuring desert tortoises when working or recreating in the desert to anyone requesting information on casual use associated with recreation and mining or on other programs that it administers. This information may be in the form of literature prepared specifically for this purpose or other general educational materials related to the desert tortoise's status as a threatened species.

Law Enforcement Rangers and Maintenance Personnel. The Bureau notes, in the final environmental impact report and statement, that two law enforcement rangers and two maintenance personnel would be assigned to the habitat conservation areas to ensure their proper management. An increase in the presence of Bureau employees in desert wildlife management areas may greatly enhance the likelihood that the conservation strategies being proposed in the West Mojave Plan can be successfully implemented. In the absence of Bureau staff in the field, we sense that the public will not view the habitat conservation areas any differently than it does currently. We recognize the difficulties that agencies experience with guaranteeing staffing and funding and the particular issues associated with keeping rangers in the desert year-round; however, the Bureau's on-the-ground presence is probably the most essential element in implementing the conservation strategies in a successful manner. Consequently, we encourage the Bureau to investigate every avenue to ensure that a sufficient number of law enforcement rangers and maintenance personnel are assigned to the desert wildlife management areas to ensure compliance with the provisions of the West Mojave Plan; we also encourage the Bureau to assign these personnel in a manner that ensures an in-the-field presence on a year-round basis, with particular emphasis during periods of heavy public use.

Commercial Activities. We recommend that the Bureau provide higher priority to the conservation of listed and other sensitive species than to commercial activities, such as filming. That is, we recommend that conflicts between listed or sensitive species and commercial activities that can be conducted in areas without such resources be resolved in favor of the biological resources.

Abandoned Adits and Mines. The Bureau should inspect any abandoned mine or adit it discovers to determine whether desert tortoises could be trapped. Any such mines or adits should be filled or fenced to preclude entry by desert tortoises.

Indirect Effects of Mining and Other Human Activities. We encourage the Bureau to support research and work with others to determine if dust from mines, agricultural fields, the edges of roads, and disturbed playas is affecting the health status of desert tortoises.

Research Related to Grazing. The Bureau proposed to conduct a study of the nutritional ecology of the desert tortoise in relation to livestock grazing. We recommend that the design of any such study be developed in coordination with the Service and the U.S. Geological Survey to ensure that it addresses the most relevant issues in the most effective manner. We also strongly recommend that the Bureau assess the current condition of allotments from which grazing has

recently been removed and monitor the changes in habitat conditions in those allotments over time.

Johnson to Parker Race Events. We recommend that the Bureau coordinate with us early in the planning process if an application for this event is proposed. The Bureau should limit the event to times of the year when desert tortoises are less likely to travel widely; it should also ensure the riders remain on designated roads, particularly within the Pisgah Conservation Area to protect desert tortoises and the white-margined beardtongue (*Penstemon albomarginatus*), which is a sensitive plant species found in that area of the California desert.

Extended Fee Program. We recommend that the Bureau adopt a fee program for recreational use of public lands in the California Desert Conservation Area. To the best of our knowledge, users pay some form of fee to use most other recreational lands in southern California. Mandatory fees on adjacent lands likely assist in funding the management of those lands and possibly assist in directing recreational use to lands managed by the Bureau. We suggest that, as an initial strategy, the Bureau establish mandatory fees for organized events and a voluntary system for casual users.

Shooting. We recommend that the Bureau prohibit target shooting in all conservation areas, including the desert wildlife management areas. Although the number of desert tortoises that are likely to be shot accidentally or intentionally is likely a small proportion of the population, preventing the loss of even a small number of individuals in a declining population may be important for the overall recovery of the species.

Please notify us if you implement any conservation recommendations so we may be kept informed of actions that minimize or avoid adverse effects to listed species or their habitats and promote their recovery.

REINITIATION NOTICE

This concludes formal consultation on the proposed amendment of the western Mojave Desert portion of the California Desert Conservation Area Plan. Reinitiation of formal consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Ray Bransfield of my staff at (805) 644-1766, extension 317.

Attachments

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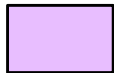
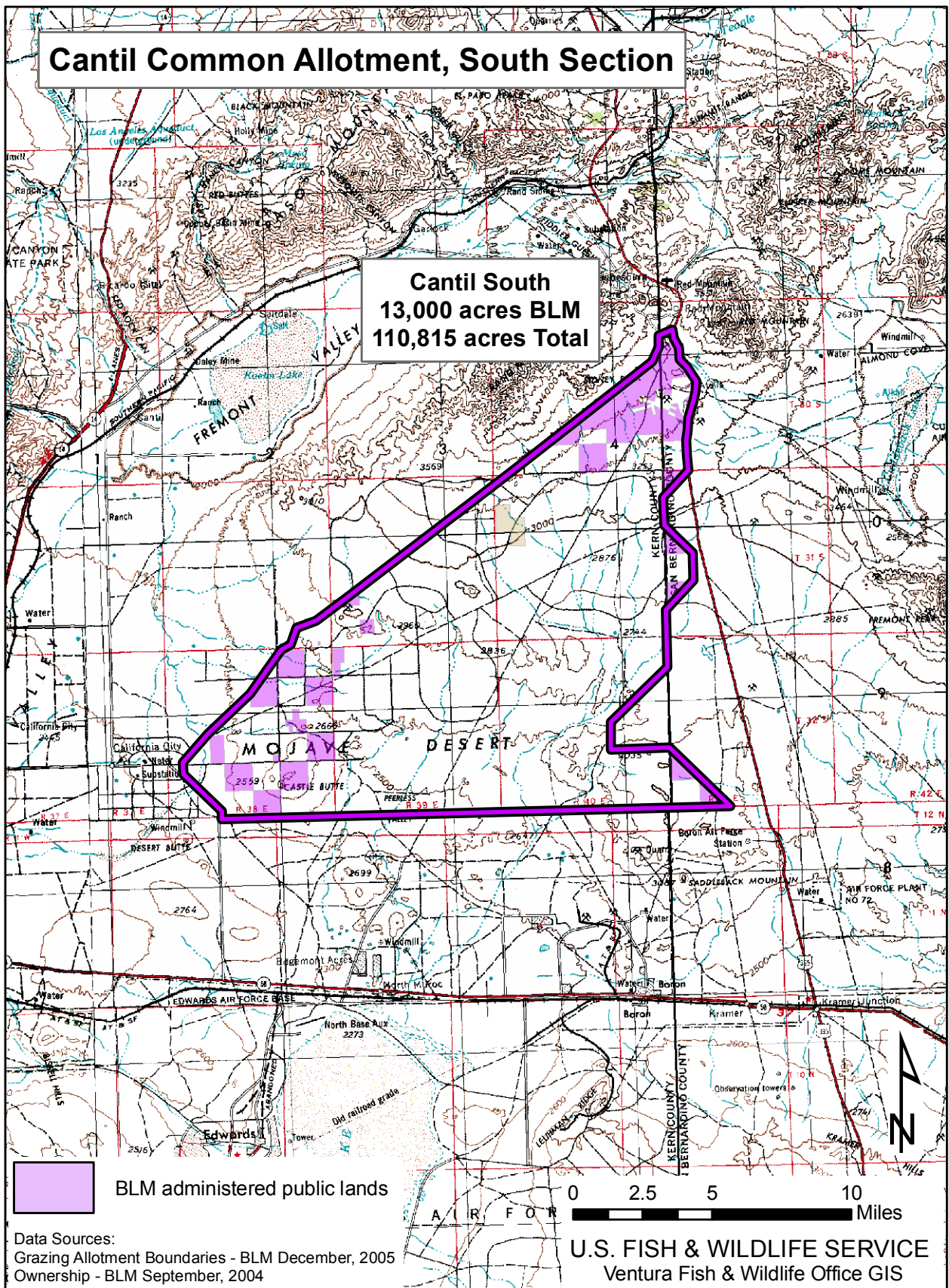
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Cantil Common Allotment, South Section

Cantil South
13,000 acres BLM
110,815 acres Total



BLM administered public lands

Data Sources:
 Grazing Allotment Boundaries - BLM December, 2005
 Ownership - BLM September, 2004

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